

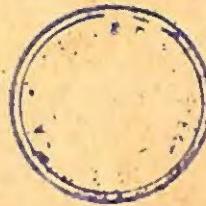
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FINANCE AND BUSINESS ADMINISTRATION



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Finance and Business Administration

Reviews the literature for the three-year period, October 1946 thru September 1949. Volume XVII, No. 2, April 1947, covers the previous three-year period.

TABLE OF CONTENTS

| <i>Chapter</i> | | <i>Page</i> |
|---|--|-------------|
| Foreword | | 103 |
| I. Support of Education..... | | 105 |
| ARVID J. BURKE, <i>New York State Teachers Association, Albany</i> | | |
| EDGAR L. MORPHET, <i>University of California, Berkeley</i> | | |
| II. Relation of School District Reorganization to Finance and Business Administration | | 115 |
| ROE L. JOHNS, <i>University of Florida, Gainesville</i> | | |
| EDGAR L. MORPHET, <i>University of California, Berkeley</i> | | |
| III. Educational Costs and Their Analysis..... | | 124 |
| WILLIAM P. McLURE, <i>University of Illinois, Urbana</i> | | |
| WAYNE W. SOPER, <i>State Education Department, Albany, New York</i> | | |
| IV. Budgeting, Accounting, Auditing, and Reporting..... | | 135 |
| ALFRED D. SIMPSON, <i>Harvard University, Cambridge</i> | | |
| V. Problems of Business Administration..... | | 142 |
| WILLIAM E. ARNOLD, <i>University of Pennsylvania, Philadelphia</i> | | |
| WILLIAM B. CASTETTER, <i>University of Pennsylvania, Philadelphia</i> | | |
| VI. Review of Developments..... | | 154 |
| FRANCIS G. CORNELL, <i>University of Illinois, Urbana</i> | | |
| Index | | 159 |

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Education for Work, Citizenship, and Leisure

Reviews the literature for the three-year period, April 1947 thru March 1950. Volume XVII, Number 4, October 1947, covers the previous three-year period.

TABLE OF CONTENTS

| Chapter | | Page |
|-----------------------------------|---|------|
| Foreword | | 256 |
| I. The Social Studies | STANLEY E. DIMOND, <i>Public Schools, Detroit, Michigan</i> RUSSELL H. BROADHEAD, <i>Wayne University, Detroit, Michigan</i> | 257 |
| II. Intercultural Education | WILLIAM VAN TIL, <i>University of Illinois, Urbana</i> GEORGE W. DENEMARK, <i>University of Illinois, Urbana</i> | 274 |
| III. Education for Work | LEONARD M. MILLER, <i>U. S. Office of Education, Washington, D. C.</i> | 287 |
| IV. Education for Leisure | GERALD B. FITZGERALD, <i>University of Minnesota, Minneapolis</i> | 294 |
| V. Home and Family-Life Education | MARY S. LYLE, <i>Iowa State College, Ames</i> | 299 |
| VI. Industrial Education | 1. Industrial Arts Education R. LEE HORNBAKE, <i>University of Maryland, College Park</i> 2. Vocational Industrial Education C. KENNETH BEACH, <i>Cornell University, Ithaca, New York</i> | 309 |

| <i>Chapter</i> | <i>Page</i> |
|--|-------------|
| VII. Business Education HAMDEN L. FORKNER, <i>Columbia University, New York</i> | 322 |
| VIII. Agricultural Education SIDNEY S. SUTHERLAND, <i>University of California, Davis</i> | 330 |
| Index | 339 |

REVIEW OF EDUCATIONAL RESEARCH

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Growth and Development

Reviews the literature for the three years ending July 1, 1950. Earlier literature was reviewed in Volume III, No. 2; Volume VI, No. 1; Volume IX, No. 1; Volume XI, No. 5; Volume XIV, No. 5; and Volume XVII, No. 5.

TABLE OF CONTENTS

| Chapter | Page |
|---|------|
| Foreword | 343 |
| I. Mental Development from Birth to Preadolescence | 345 |
| DEAN A. WORCESTER, <i>Teachers College, University of Nebraska, Lincoln</i> | |
| II. Mental Development During the Preadolescent and Adolescent Periods | 351 |
| GORDON HENDRICKSON, <i>Teachers College, University of Cincinnati, Cincinnati, Ohio</i> | |
| III. Intellectual Changes During Maturity and Old Age | 361 |
| HERMAN D. BEHRENS, <i>State Teachers College, State University of New York, Geneseo</i> | |
| ROYAL F. NETZER, <i>State Teachers College, State University of New York, Geneseo</i> | |
| IV. Motor Development and Decline | 367 |
| NANCY BAYLEY, <i>University of California, Berkeley</i> | |
| ANNA ESPENSCHADE, <i>University of California, Berkeley</i> | |
| V. Personality and Social Development | 375 |
| GLENN M. BLAIR, <i>University of Illinois, Urbana</i> | |
| VI. Physical Growth and Physiological Aspects of Development | 390 |
| KAI JENSEN, <i>University of Wisconsin, Madison</i> | |
| List of Members | 411 |
| Regional Distribution of Members | 433 |
| Index | 438 |
| | 341 |

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FOREWORD

THIS issue of the REVIEW is somewhat more compactly organized than were the six previous issues on finance and business administration. The chapters are fewer in number, tho in general context they follow topics of the earlier issues. Such consolidation is justified chiefly on the grounds that the volume of genuine research during the three-year period covered by this REVIEW would hardly produce meaningful chapters on narrowly defined topics. It is to be noted, moreover, that there is a continuing need for developing meaningful generalities by the observation of broad trends in the field of school finance and business administration. For that matter, literature in the field is dealing less and less with fragments or bits of only local significance. Several studies reported in this brief mid-century span, not to mention many statewide surveys not reported, exhibit a balanced, insightful grasp of fiscal problems of public education which indicates some maturity of both science and practice.

Chapter I on the support of education covers most of the research classifiable in the general field of school finance on both state and federal levels. Only the special topic of district reorganization was thought to have received sufficient attention among researchers to justify a separate chapter.

Similarly, all aspects of the local system of fiscal control—planning, budgeting, accounting, auditing, reporting—are treated in a single chapter, Chapter IV. A single chapter on business administration eliminates special chapters which have appeared in the past on such topics as credit regulation, personnel management, income management, and transportation.

Despite this effort to condense, there remains in this issue some unavoidable overlap between chapters and some inclusion of bibliographical items which are only marginally research.

FRANCIS G. CORNELL, *Chairman*
Committee on Finance and Business Administration

CHAPTER I

Support of Education

ARVID J. BURKE and EDGAR L. MORPHET

THE effects of postwar inflation upon educational institutions have stimulated research in school support. The Research Division of the National Education Association (48, 49) has continued to report developments in the various states. In a report of the Council of State Governments, Chase and Morphet (10) summarized the status of school finance in 1948. Studies of school finance also were made in about one-fourth of the states between 1946 and 1949. These are reviewed only if they contain an approach, innovation, technic, or finding which may be of general significance.

Economic Basis of Support

The most striking proposal during this period on the subject of the economic basis for education was made by Cox (12). She advanced the thesis that education should be supported by long-term private, personal credit insured by government for all young people aged ten to twenty-four. The evidence to support this thesis and its implications merits consideration by research workers. It is conceivable that a system of support could be worked out in which increasing use might be made of credit as persons approach maturity and enter upon advanced preparation for specific vocations.

Dewhurst and associates (14) surveyed the economic potential of the United States to provide the goods and services, including public education, required by its people. The report contains a wealth of material basic to a comprehension of the economic ability of the nation to provide an adequate level of education for all. Several regional studies such as that of the State Education Commission in North Carolina related school support to the resources of the state (54).

Local Revenues for Public Schools

Local property tax support for public education continued to decline in importance (10, 48). Property assessments have been slow to adjust to changed monetary values (25). Few restrictions placed upon local property taxes for schools during the depression have been removed (10, 51). Investigators in Illinois (21) and New York (52) questioned whether these developments should not be arrested and proposed ways to rehabilitate local property tax support. Kendrick and Strevell (25) demonstrated that the yield of the property tax could be increased greatly and proposed

needed reforms. The Committee on Tax Education and School Finance of the National Education Association took a similar position (45). Harris (18) pointed out the inelasticity of the property tax base for meeting inflation, but concluded that its yield could be increased. Burke (3) traced the history of local property tax support in the state of New York in relation to economic trends. Moffitt (32) studied state restrictions and limitations upon local support for schools.

Research is needed upon such questions as these: Has the property tax base been less elastic during the present inflationary period? If so, what are the causes? What are the obstacles to property tax reform? How have certain states and localities successfully overcome these obstacles? What happens to public school revenues in a period of falling incomes and prices where the local property tax has become a relatively minor source of public school revenues?

Local nonproperty taxes have shown a phenomenal growth in recent years (57), but school districts generally have been reluctant to take advantage of them. The New York law permitting counties to levy such taxes for educational purposes was appraised by the Educational Conference Board (52). It proposed methods of integrating such taxes into a sound school finance program. Walker and Cocking (74) studied the potential yield of local nonproperty taxes in the state of New York. The Pennsylvania law granting increased local taxing powers to school districts was attacked by Reller (60). Burkhead (5) studied the effects of the Pennsylvania experience and appraised the experiment against seven criteria. In a symposium sponsored by the Tax Institute (67) Gray presented the case for the Pennsylvania law; Johnson and Boles summarized the case against such taxes; and Maxwell and Glander, while recognizing the limitations, concluded that they would continue to make some use of local nonproperty taxes in a revenue system.

A thorough appraisal of the Pennsylvania experience is needed. We have little research on this relatively new development. What types of taxes can be successfully and economically administered by school districts? How can these be integrated with the federal and state tax structures? How can they be fitted into a sound over-all school finance plan?

State Revenues for Public Schools

Both the amount and the proportion of public school revenues derived from state taxes have increased greatly since 1946 (4). The continued abandonment of earmarked state taxes for schools has made schools more dependent upon the total state tax system (10). State tax support for schools has risen more than have state tax collections (55). The relative burden of state and local taxation for schools, nevertheless, has decreased because of the rapid rise in income (10).

Research in school finance has dealt more with apportionment problems than it has with sources of state school revenues. The National Edu-

cation Association (49) and the Council of State Governments (10) have summarized recent developments in state revenues for schools. Norton and Burke (55) showed the potentialities of increasing state tax revenues for schools. Harris (18) pointed out some of the shortcomings and limitations of state taxes for schools. The State Education Commission in North Carolina, among other state survey agencies, analyzed the tax base and tax effort for the support of schools (54).

The fact that the state has moved ahead of local government as a taxing unit has increased the problems of state and local tax coordination and relationships. The Council of State Governments studied the problem from the viewpoint of the states (11). Mott (42) and a New York joint committee (52, 53) stressed the home rule aspects of the problem.

The Federal Government and the Support of Education

The effects of heavy federal taxes (and the nature of the federal tax structure) upon state and local support of schools received little attention in educational research from 1946 to 1949. Harris (18) showed the effects upon support for private colleges and universities. The Hoover Commission (69) and the United States Treasury Department (73) issued reports on federal-state relations, the latter stressing tax coordination.

During the past three years there have been no new types of data on the need for federal support for schools. Data gathered by the Council of State Governments (10) showed that differentials in ability among states are still extreme. Norton (44) found the same tendency in expenditure levels for schools. The National Education Association (43) summarized existing data on the need for federal aid for schools. Quattlebaum (58) made a careful analysis of all issues involved, gave digests of reports and studies, and enumerated arguments for and against federal aid. The Hoover Commission (70) reviewed federal activities in education and examined their effects upon states. Johnson (24) made a very thorough study of equalization formulas with special reference to federal grants. Simpson (62) urged the states to make greater effort to solve some of their own problems and stressed that even if all states established the best possible program, federal aid would be needed.

The question of federal aid for schools as related to the possible dangers of federal control continued to receive attention. Fuller (15) suggested practical ways of avoiding undesirable federal controls. Reavis (59) proposed safeguards and criteria that should be observed.

Support for Higher Education

Chamberlain (7) and Hoff (19) studied fees in colleges and universities. Harris (18) showed the limitations of endowments and the effects of raising fees. Hungate (20) reported the trends in support for higher

education. Studenski and Baikie (66) studied the financing of higher education in the various states with special reference to New York. Stewart and Lyon (64) centered attention upon the financing of capital outlays in state colleges and universities. The President's Commission on Higher Education (72) analyzed the financial difficulties of institutions of higher learning, made estimates of future requirements, and recommended a program of support for the future. It concluded that local public support probably would not increase very much, that state support would not increase enough to meet the needs, and that substantial federal support would be required. Further analysis of literature on higher education from the point of view of costs appears in Chapter III of this issue.

Policy and Direction in Public School Finance

The inadequacies of local support in many states and the increased proportion of state support have centered attention upon fundamental policy and direction in school finance. The Council of State Governments study (10) showed that most states are pursuing conflicting policies, that practices are not always leading in the same direction, and that improvements are possible in all states. The many studies that have been made in individual states indicated the growing concern over school support policy. Recent legislation in many states represented some rather fundamental changes in policy growing out of such research. The National Education Association summarized school finance goals (47).

A joint committee of the New York State Educational Conference Board and the Public Education Association of New York City (52, 53) reviewed the major policy issues in public school finance with special reference to the state of New York. The NEA Committee on Tax Education and School Finance (45) summarized the principles upon which a group of school finance specialists were in substantial agreement. The Council of State Governments (10) proposed desirable changes in present state finance practices. The American Association of School Administrators (1) summarized some needed developments. Morphet (35) listed what he considered to be the major issues in school finance. Cocking and Morphet (8) suggested essential improvements in school finance. Liggitt (26) emphasized the preserving of community control over public educational policy. Dawson (13) analyzed the problem from the point of view of rural education. Covert (71) summarized the features of a satisfactory school finance plan based upon current practice.

State Foundation Programs as a Basis for Public School Finance

Since most states seem to be moving toward the development of some type of foundation program as a basis for school finance this area has continued to receive considerable attention. Chase and Morphet (10)

showed that while approximately forty states had established some type of foundation or equalization program, either the funds are too limited or the bases used are too unsatisfactory in at least half of the these states for the program to be of much significance. In several states the funds are apportioned on subjective bases or in terms of approved budgets. This study also showed that practically all states apportion some funds on a flat grant basis, regardless of need, and that nearly two-thirds of them apportion at least 50 percent of all funds on this basis.

The NEA Research Division published an analysis of state foundation program laws for the year 1947 (50). The desirable features were summarized in a concluding three-page statement. Mort and Burke (40) made a study of the cost of the foundation program for the state of New York. McLure (30) and Sargent (61) examined the foundation program concept from the viewpoint of educational returns at varying expenditure levels. Woollatt's study (76) also contributed to understanding the cost-quality relationship. McLure (31) discussed new methods for measuring costs of foundation programs. Pearman (56) suggested a plan for additional stimulation for districts that wish to exceed the minimum program. Several studies, summarized later, deal with special phases. Comprehensive principles and criteria for a foundation or partnership program of school support have been proposed by the NEA Committee on Tax Education and School Finance (45).

Measuring Need and Costs—the Apportionment of State School Revenues

Chase and Morphet (10) warned against using subjective measures or rough objective measures, such as the school census, that do not accurately gauge the needs. They pointed out the advantages of the classroom unit measure and, under some circumstances, of the weighted pupil measure. The NEA Committee on Tax Education and School Finance (45) recommended both of these measures. Both reports warned against relying entirely on present practice as a criterion, which may discriminate against elementary schools or tend to perpetuate small nonisolated schools and districts. In all studies, including the state studies, much greater emphasis than previously has been placed on developing special adjustments only for objectively defined isolated small schools. McLure (29) proposed population sparsity as an objective means of attaining the same results. Sargent (61) questioned the assumption that the cost of equivalent educational opportunity may be determined by multiplying average practice with respect to pupil-teacher ratios by a constant cost factor. He proposed that the foundation program be stated in terms of educational services, expressed as weighted units of service, and developed a formula for use. The application of this formula was illustrated in terms of the situation in New Hampshire.

Mort and Schmidt (41) summarized recent developments in the techniques of apportionment. Morphet (34) explained the technic developed in Florida for determining instruction or classroom units and teachers' salaries; Morphet and Johns (38) explained the plan used for determining units for kindergartens and junior colleges; and Morphet and Messer (39) the plan for incorporating vocational education as a part of the foundation program. Cornell (9) developed a generalized mathematical synthesis of apportionment patterns for federal and state grants showing algebraically the similarities and differences among more important types. The analysis was intended to permit determination of characteristics of apportionment methods without numerical computation.

Johns (22) discussed a plan, which is essentially a refinement of the plan developed in Alabama and Florida, for measuring transportation need primarily on the basis of density of transported pupil population.

Wochner and Miller (75) analyzed developments in equalization, indicated that some states had rewarded small inefficient schools or districts by making special adjustments for all such schools, and pointed out that special adjustments for transportation and for state aid in general should be provided at least chiefly in terms of sparsity of population.

The National Education Association (46) made a study showing that about twenty states were using qualifications of teachers as a criterion for the distribution of state school funds and recommended that this procedure be carefully studied by all states. Morphet (37) discouraged the use of state teachers' salary schedules, as such, but recommended, with reservations, consideration of qualifications in the apportioning plan. The NEA Committee on Tax Education and School Finance (45) questioned the practice and recommended minimum use of earmarked programs.

Financing Capital Outlays

Altho only about a dozen states have thus far developed any comprehensive plan for financing capital outlay in the state program, several studies show the urgent need for such a program in all states.

The Council of State Government's study (10) summarized the present status and recommended that all states face this problem. The American Association of School Administrators (2) suggested factors to be considered and also pointed to the need for state support for buildings. Hamon (17) estimated the total need, showed that only a few states have developed a bona fide program, and stressed the need for careful study. Bursch (6) pointed out the need and explained the plan in California which was on an unsatisfactory budget deficit basis. Strevell (65) showed that population sparsity affects unit costs of buildings, a factor which must be recognized in apportioning aid for capital outlays.

Lindman (27) developed an equalized matching formula for administering state support for capital outlay as a separate fund. He also (28)

traced developments in the field, showed the urgent need for state support, and showed how his formula could be used.

Morphet (33) listed some of the problems that must be faced and pointed to the importance of adequate state support. Johns and Morphet (23) explained the plan used in Florida for incorporating support for capital outlays as an integral part of the foundation program.

Measurement of Local Ability To Support Schools

Because of marked variations in local assessment practices in most states and resulting inequities when a uniform tax rate is prescribed for local districts, the problem of measuring local tax effort has received considerable attention during recent years. Covert (71) attributed the adoption of completely state-supported minimum programs to the lack of satisfactory measures of local fiscal capacity. Chase and Morphet (10) stressed the desirability of uniform assessment policies but called attention to the fact that this apparently could not be attained in most states. They suggested, as an alternative, the development and application of uniform ratios. Where that is not done they proposed the development of an objective index of taxpaying ability similar to those used in Alabama and Florida. Several of the state studies, notably Georgia (16), North Carolina (54), South Carolina (63), and Texas (68), explained the plan for developing such an index and proposed that it be used.

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CHAPTER II

Relation of School District Reorganization to Finance and Business Administration

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MORE interest concerning the need for district reorganization has been shown during the past three years than ever before. Grieder made approximately the same statement concerning the three-year period preceding the April 1947 issue of the REVIEW. The accelerating interest in district reorganization is shown by the following: The April 1947 REVIEW included references to 17 state surveys and commission reports devoted in whole or in part to district reorganization and four national studies; the present number includes references to 23 state studies and nine national studies; the past three-year period has been one of implementation and achievement in district reorganization; and some aspects of the subject were reviewed by Cooper in the October 1949 issue of the REVIEW.

In 1948 Wochner (59) made a study of reorganization activity and found that 27 states were reorganizing local school units in some degree and that 15 of the states were reorganizing as a result of a formal reorganization act which sets up machinery for doing it. He reported that the number of local administrative units had declined from 117,000 in 1940 to 94,000 in 1948. The Illinois State Advisory Commission (30) reported that the number of districts in Illinois had been reduced from 11,906 in 1946 to 5859 in 1949. By legislative action Florida (25) in 1947 abolished 720 local tax districts and reorganized the state into 67 complete county units with no subdistricts. Texas (56) as a result of legislation enacted by the 1949 Legislature has already eliminated about 1500 small districts and all territory is now in some school district. Idaho (24) has reorganized or partially reorganized 29 of its 44 counties. These recent developments are much more encouraging than were achievements in previous years. Smith (53) made a study of state constitutional and statutory plans for district reorganization between 1938 and 1947. He found that only nine states had set up definite statutory plans for reorganization of districts and that most statutes dealt with the piecemeal consolidation of schools rather than the elimination of the evils of the small district.

Evidently no new insights into the problems of district reorganization have been developed in research produced during the period covered by this number. This period has seen the application and adaptation of the findings of research of previous years more than the production of new approaches. The trend toward application of the findings of research may be more encouraging than the production of quantities of new research which does not find its way into educational practice.

Development of Criteria for District Reorganization

Criteria for district reorganization have been applied extensively during recent years. No new criteria have emerged during the past three years but those developed in previous years have been applied more widely. The criteria applied usually have included statements concerning the reorganization of attendance areas as well as administrative districts. The Georgia survey (1), the New Mexico survey (6), and the South Carolina survey (7), the Spartanburg survey (8), the California State Commission (14), the Wisconsin State Department of Education (15), Carpenter (16, 17), Chisholm and Henzlik (21, 28), Gregg (27), the Indiana survey (31), Kulp (33), Lobaugh (34), the Minnesota Institute of Governmental Research (39), the Montana Education Association (41), the National Commission on School District Reorganization (43, 44), the National Education Association (47), the North Carolina survey (48), Reusser (51), Sumption and Beem (54), and Taylor (55) all presented criteria for the reorganization of school districts. The criteria in these reports were on the whole similar to those recommended by the National Commission on School District Reorganization (43), which, summarized briefly, were as follows: (a) a minimum of at least 1200 pupils—per-pupil costs decline up to 10,000 pupils, and if the number of pupils is considerably less an intermediate district is necessary to provide supervision, guidance, transportation, and junior college offerings; (b) each teacher qualified to do a particular job well—one or more teachers for each grade or subject and a qualified central staff of administrators, supervisors, and clerks; (c) one or more elementary schools, at least one high school, and where possible a junior college; (d) at least one teacher per grade for each elementary school; (e) not fewer than 75 pupils per grade and not fewer than 12 teachers for each high school; (f) each elementary school to serve a neighborhood or small community and each high school a larger community.

There were, however, some basic departures from the criteria recommended by the National Commission (43). Some studies recommended the inclusion of the assessed valuation or wealth of the local district as a criterion. Among those who recommended that criterion were the following: the Wisconsin State Department of Education (15), Carpenter (17), the Montana Education Association (41), the National Education Association (47), Reusser (51), and Taylor (55). The National Education Association (46) stated that each basic school administrative unit should be large enough to include "adequate financial resources to meet its share of the cost of the foundation program," and the Montana Education Association (41) stated that "taxable wealth should be high enough in the new district to bear at least three-fourths of the educational cost." Recommendations of this type seem to disregard the equalizing potential of the state's plan of financing. With reference to the district organization problem, the most promising trend in state support, as reported by the Committee on Tax

Education and School Finance (45) and the Council of State Governments (22), is the equalization or foundation program plan. A comprehensive equalization plan of state support gives due consideration to the relative taxpaying ability of local school districts in distributing state funds. Under such a plan, the taxable wealth of a local district should not prevent an area from becoming a good district if it meets other acceptable criteria. It is suggested that research in school financing be given due consideration when studying the problem of district reorganization.

There seems to be division concerning the criterion relating to size of the administrative unit, especially as it relates to the community. Chase (27) analyzed the advantages and disadvantages of the community as the administrative unit and concluded that substantially every advantage that has been claimed for the community administrative unit can be obtained within the larger district, provided each community center is given a school which can meet community needs. He warned that if community administrative units were adopted, sooner or later a need would develop for an intermediate unit superimposed upon community units to provide services they could not afford. Chambers (18) also recommended the larger unit such as the county and stated that the nation needs no more than 5000 districts whereas it has in excess of 100,000. The county unit or a modified county unit system of district organization was recommended in the Georgia survey (1), the New Mexico survey (6), the South Carolina survey (7), the Indiana survey (31), and the North Carolina survey (48). On the other hand, smaller administrative units supplemented by intermediate units were recommended by Butterworth (9, 10, 11), and Carpenter (16, 17). Henzlik and Chisholm (28) recommended the community administrative unit. The National Commission on School District Reorganization (44) indicated the necessity of intermediate units if a district has considerably less than 10,000 pupils. Somewhat out of harmony with the national trends was the recommendation of the Massachusetts Special Commission (38) for the establishment of regional high schools to serve two or more towns. This recommendation involved the superimposing of a high-school district upon elementary districts. All other studies included in this review which treated the subject recommended unified districts including all grades.

How To Achieve District Reorganization

Much emphasis has recently been given to developing ways and means to initiate school district reorganization. The evidence now available seems to indicate that the initiative for school district reorganization must come largely from the state but that local school units have a vital part to play in the reorganization process. The reorganization procedure recommended by the National Commission on School District Reorganization (43) has met with the most common acceptance. The Commission (44) recommended: (a) a state commission to furnish leadership in school district

reorganization; (b) county or local committees to conduct surveys and present reorganization plans to the state commission for approval in accordance with sound criteria; (c) public hearings and a majority vote of the area concerned or action by the legislature for putting the plans into effect. Authorities are generally agreed that the state has the constitutional authority and the responsibility to determine its school administrative districts, but most authorities believe that the people of the local units should participate directly in the reorganization process. Breckner (5), the California Commission on School Districts (12, 13, 14), Callahan (15), Chase (19), Henzlik and Chisholm (21, 28), the Council of State Governments (22), Dean (24), Geyer (26), Gregg (27), the Illinois State Advisory Commission (30), Kulp (33), Lobaugh (34), Mulford (42), the National Education Association (47), Reed (50), Reusser (51), Smith (53), Wheeler (58), and Wochner (59) either recommended plans for initiating school district reorganization similar to the plan recommended by the National Commission on School District Reorganization (44) or reported on the progress of the operation of such plans.

State Financial Policies Affecting District Reorganization

The relationship of state financial policies to the problem of district organization has properly been receiving increasing attention during recent years. However, there has been no adequate study of this important matter in many states in which the evidence indicates that certain financial policies are tending to retard or even practically to prevent needed reorganization of school districts or consolidation of schools.

The California Commission on School Districts (13), after showing that the present district organization not only is expensive but also creates inequalities and threatens local control, concluded that "existing state policy governing the apportionment of the state school fund retards reorganization of school districts in California."

The National Education Association Committee on Tax Education and School Finance (45) concluded that maximum benefits of an adequately financed foundation program will not be realized unless local school government is a vital functioning part of the educational structure and also called attention to the fact that the state is responsible for creating a pattern of local school district organization which can assume and discharge its proper responsibilities.

Several recent reports of state studies, especially those for South Carolina (7), New Mexico (6), Indiana (31), North Carolina (48), New Hampshire (52), and Texas (56), have called attention to provisions in the state aid law that tend to encourage the perpetuation of small districts or schools by providing extra rewards that cannot be defended. In such instances one aspect of state policy is tending to prevent what a more important aspect of state policy seems to be trying to encourage.

Reller, in the *Annals of the American Academy of Political and Social*

Science (2), concluded that it is to be regretted that as states have increased the funds provided for education they have not simultaneously stepped up the local structure so the funds could lead to the achievement of more significant results.

The National Commission on School District Reorganization (44) called attention to the fact that one of the most important elements in the reorganization of local school units is the financing of schools. The commission listed several factors that might either accelerate or retard the organization of adequate local school units and concluded that the proper organization of local school systems must be an objective of the state, fortified by its system of school finance, which should provide distinctly and specifically for assuring that all essential costs can be met including instruction, transportation, and capital outlay.

Chase and Morphet (22) found that states listed more factors in their state programs that discouraged reorganization than factors that encouraged needed reorganization. They pointed out six conditions in state policy that seemed to be essential to encourage reorganization and called attention to the fact that only a few states had met all of these. Even when only one of the conditions has not been met serious handicaps seem to result. They concluded that all states need to examine their policies to see that no unnecessary handicaps to reorganization exist, and that both incentives and guidance are provided for the creation of districts having the ability to provide needed educational programs and services at reasonable cost.

Local School Surveys

Comparatively few local school surveys deal with the problem of district organization as related to finance, probably largely because most of them deal with a specific school district. Some of them consider the problems that may result from the attendance in the district of children from other nearby areas. When a board is studying its own problems or contracting to have them studied, it seldom considers officially the possibility of merging its district with some other district, or even of getting some other districts to merge with it.

In this respect the Survey of the Spartanburg County, South Carolina, Schools (8) constitutes an exception, largely because the study includes an entire county in which there are several districts, and, therefore, necessarily considers the problem of district organization as related to finance and other phases of the program. This report proposed criteria that should be observed in reorganizing the school districts of the county.

The School Building Survey of Pinellas County, Florida, (32) pointed out that the establishment of districts within a county administrative unit for the issuance of bonds hindered the equalization of educational opportunity. The survey recommended, therefore, that county units abolish all special taxing and bonding districts within their borders.

Economy and Efficiency Related to District Organization

Studies made of the relationship of reorganization to economy and efficiency did not always distinguish between reorganization of administrative units and reorganization of attendance areas. However, in states maintaining thousands of one- and two-teacher administrative districts, the major benefits of district reorganization cannot be attained without at the same time consolidating a large number of schools, so, therefore, it is difficult to separate these two problems.

Aderhold (1), Bradshaw (4), Brewton (6, 7), the California Commission on School Districts (12), Dawson (23), Henzlik and Chisholm (28), the Illinois Legislative Council (29), the Minnesota Institute of Government Research (39), Morphet (25), the National Commission on School District Reorganization (44), and the United States Chamber of Commerce (57) concluded that the reorganization of school districts could result in either reducing expenditures or producing better educational returns for the same expenditure. Numerous studies have shown that the per-capita costs of small schools were higher than those of large schools, and Pillsbury (49) made a study in Connecticut which showed that large schools obtained desirable educational objectives more effectively than did small schools. Beach and Gibbs (3) reported that state departments of education could not render services economically or effectively in states with an excessive number of small districts.

McLure (36, 37) and the Montana Committee on Elementary and Secondary School Organization and Finance (40) observed that district reorganization was necessary in Mississippi and Montana before a state equalization plan of financing could be made effective.

The California Commission on School Districts (12), Dean (24), Lobaugh (34), McIntyre (35), and the Montana Education Association (41) presented evidence which indicated that local tax rates could be more nearly equalized by district reorganization.

Needed Research

Important among the problems associated with district reorganization concerning which more adequate research is needed are the following: (a) the effect of state financing programs upon district reorganization; (b) the community versus an aggregation of communities as the basic local school administrative unit; (c) the administrative unit for the administration of junior colleges; (d) the probability that better educational programs have actually been provided in reorganized units.

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CHAPTER III

Educational Costs and Their Analysis

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STUDIES during the period covered by this REVIEW, as in previous years, have analyzed costs against a background of educational purposes and results. Considerable attention has been devoted to problems that may be grouped as: trends of costs, inequalities, effect of teachers' salaries on costs, building needs, educational returns, foundation program costs, comparable units of cost, higher education, and future costs.

Trends of Costs

Several studies have been concerned with trends of school costs. The National Education Association (50) reported in a national inventory of public school finance in 1946-47 that expenditures did not increase enough from 1940 to 1947 to permit schoolboards to hold their own in educational purchasing power. Mort and Burke (48) studied the trends of school costs since 1940 and concluded that educational standards achieved with \$100 per pupil in 1940 required twice this amount in 1947. Burke (10) related the percent increase in teachers' salaries since 1939 to such economic trends as state income, state salaries and wages, minimum salaries of civil service workers, and prices received by farmers and other groups. He pointed out that teachers' salaries have fallen further behind incomes of other groups during this period. Clark (16) observed that the relative income of teachers in February 1949, compared to all other groups, was only 70 percent as good as the prewar status of 1939.

A group of school finance specialists (51) in conference on school finance problems noted the trend toward a smaller, if not completely eliminated, cost differential between grade levels, in both salaries of teaching personnel and pupil-teacher ratios. However, Burke (12) noted that the median salaries of elementary-school teachers in the state of New York increased 61 percent from 1939 to 1949 while the corresponding increase for salaries of high-school teachers was 77 percent.

Inequalities

Current inequalities in financial support have been portrayed in the report of the Council of State Governments (17). Notable inequalities found among states were (a) average per-pupil expenditure in the highest state about four times the average in the lowest state, (b) wide

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variation in preparation of teachers, (c) average annual salaries of teachers ranging from \$3400 downward to less than \$1300, (d) average per-pupil value of school property ranging from \$600 in seven states to less than \$200 in four states, and (e) average per-pupil expenditures for textbooks and teaching supplies varying from eight dollars in seven states to less than two dollars in four states.

Effect of Teachers' Salaries on Cost

The Council of State Governments (17) used the percentage of all teachers receiving \$2400 or more as a better indication of the status of teachers generally, than the average salary of a state. It was noted that insufficient research is being done to analyze the consequent effect upon cost of adequately filling the present gaps in teacher supply, considering proper salaries, sick leave benefits, and retirement provisions. Burke (11) noted that all states have set minimum qualifications for teachers, but few of them have assessed the financial implications of this policy. Baldwin (4) observed that one outcome of the West Virginia state minimum salary schedule was the achievement of more equalization. Haskew (26) proposed a salary bill of rights for teachers to include among other things an income adequate to encourage professional preparation and performance.

School Building Needs

There has been limited research on the underlying factors related to variations in cost of school building needs. However, the literature is replete with observations which may be helpful leads in future studies. Higgins (29) listed five factors affecting building costs: (a) productivity of workmen, (b) availability of materials on the job, (c) percentage of cost devoted to carpentry, (d) building codes and ordinances, and (e) designing. Butterfield (13) proposed the construction of cheaper buildings furnished with useful equipment and designed to serve all pupils as a preferred alternative to utilizing inadequate financial resources for providing expensive buildings which would be poorly equipped and capable of serving but few pupils.

Engelhardt (19) compared cubic-foot costs of buildings constructed before and after the war with additions conforming to existing buildings. In the latter case cubic-foot costs were inflated because alterations were usually included in cost but excluded from cubage estimates. He pointed out that cubic-foot costs may be misleading due to wide variations in scope of work. Bartels (5) developed an index of total cost of schoolhouse construction in the city of Cincinnati based upon indexes of construction cost as related to adjusted interest rates. Pitkin (62) reported that the cost unit (pupil) used for distributing state building aid in Massachusetts means net average membership of pupils residing in each

town regardless of where they attend school. No analysis was made concerning the possible effect of indirectly subsidizing private schools thru the adoption of this type of cost unit in a state finance plan.

Holmstedt (35) stated that fiscal needs of school buildings must be analyzed in terms of (a) educational services, (b) community growth and development, (c) character of new population, (d) trends in business and industry, (e) types of workers and level of wages, (f) projection into the future, and (g) financial resources within bond and tax limitations. Johnson (39) cited four basic elements of construction costs: labor, material, design plus supervision, and finance. Holden (32) cited examples of items planned to reduce maintenance cost: washable wainscots, elimination of exposed piping and radiation, built-in storage cabinets, linoleum floors and caulk base, reversible sash windows, and terrazzo corridor floor with caulk base. Wilson (74) voiced a need for a united front in developing carefully studied needs as a basis of cost analysis.

Cost—Quality Relationships

The Florida Citizens Committee on Education (21) observed that education was more adequate in counties of higher expenditures. However, exceptions were noted in a few counties, due apparently to local efficiencies and inefficiencies in organization and operation. A study by McLure (45) of over 100 representative schools on three expenditure levels in the state of Mississippi revealed significant differences in educational practices generally associated with returns. The study of the National Commission on School District Reorganization (49) pointed out, as others have done, that the cost per pupil is related not only to the size of the school, but also to the quality of its educational offering. Studies of Henzlik and Chisholm (28) showed that the level of pupil achievement, teachers' salaries, teacher preparation, and kind and amount of supplies and equipment were related to the level of per-pupil expenditure. Woollatt (76) analyzed the relationship between educational cost and quality of returns in a group of schools on high expenditure levels; the results showed no tapering off on educational returns as expenditure levels increased. Pierce (61) found that favorable community factors contribute to the quality of schools in a way that the expenditure of more money may never do.

Proctor and Dyer (63) found that, in general, the less money a state spends per capita for elementary and secondary education, the fewer outstanding scientists it is likely to produce. Bowyer (7) attempted to analyze the economic value of education to the states by measuring the economic return which states have derived from money expended on public schools. He concluded that the work of the schools had a causal bearing upon economic development, taking most effect within 10 or 12 years after the date of the school expenditure.

Foundation Program Costs

The cost of the foundation program proposed by the Florida Citizens Committee on Education (21) was determined by grouping elements of cost into four categories: instruction, transportation service, other current expenses, and capital outlay and debt service. Objective bases were developed for analyzing a fair allowance for each of these elements in a foundation program. Mort and Burke (48) reported that all analyses of the cost of a defensible foundation level have fallen short of the thinking of citizens on educational matters. According to Mort (47) the foundation level can operate automatically in line with economic factors affecting the cost of education with proper adjustment to price changes. Sargent (65) developed cost units designed to take differences of services into account. Additional references on foundation program costs appear in Chapter I of this issue of the REVIEW.

Comparable Units of Cost

The report of a public school survey in West Virginia (68) included a plan based upon population sparsity as a means of adjusting cost units to a basis of comparability among large administrative districts. The units thus equalized would be useful for financing a foundation program on any expenditure level. McLure (43) used this technic in developing methods of measuring the effect of population sparsity on school cost. In a study of intermediate districts in the state of New York (58) two improvements were proposed for the cost unit of educational need. First, it was proposed that the average daily attendance of any 125 days selected by the school district authorities be used instead of the total annual average daily attendance. Second, a method was developed to make adjustment for the character of dispersion of population. The contribution to the analysis of foundation program costs in this study was the distinction between cost of a basic school program that might be operated in constituent local districts and the cost of special services that might be provided to several constituent districts thru what was called the intermediate district. McLure (44, 45) developed methods of adjusting the cost unit (the pupil) for achieving an equalized foundation program among counties in Mississippi for three categories of school cost: operating expenses of the basic program, special services to be provided at the county level, and capital outlay and debt service requirements.

Three studies have considered analysis of a given foundation program for buildings expressed as a given cost per-weighted pupil (or per-weighted classroom) rather than a given cost per actual pupil. The first study was completed by the New York State School Boards Association (59) and included 85 reasonably comparable building projects. McLure (45) came to similar conclusions in analyzing the cost of 23 building projects in the state of Mississippi. Strevel (69) found that public school

enrolment, weighted for sparsity of population, produces a reliable cost unit for estimating the total cost of equitable foundation building needs among local districts.

A group of research workers (51), in conference on issues and research problems in school finance, placed emphasis upon the tendency to focus attention of the people on a broader conception of relationships between levels of cost allowances and the quality of education to be guaranteed all children. The cost unit of educational need was viewed as a dynamic phenomenon in moving toward an adequate program. Such a unit should be capable of automatic adjustment to account for cost variations over which local school administrative districts have no control—number of children, variations in number of children requiring transportation, necessary differences in average sizes of teaching groups, and cost of special features such as classes for handicapped children, adult education, and vocational education.

Higher Education

The President's Commission on Higher Education (72) recommended a vast expansion of the resources for higher education and proposed a substantial increase in the portion of the national income expended for higher education. Simpson (67) and Zook (77) appraised the Commission's findings, the former pointing out some weaknesses in the recommendations.

According to Hungate (36, 37) and Harris (23, 24) the pattern of financial support for higher education underwent a change during the last three decades. Collectively the shift from private to public support has been pronounced (30, 33, 56, 66). Chamberlain (15), Harris (25), Hoff (31), Kirchner (40), *The New York Times* (60), and Reck (64) pointed out that gifts, bequests, and endowment income for privately controlled institutions have proportionately declined while tuition and student fees increased both in publicly and privately controlled institutions. Harris (24) discovered that tuition increased more than the cost of living between 1913 and 1946 but declined relative to the output of goods and services. Henderson's study (27) indicated that tuition fees and living costs away from home are barriers to higher education for many able youth.

Altho there was an increase in the actual amount of gifts and bequests to privately controlled higher institutions as pointed out by Marts (42), the rate of return on investments declined according to Harris (24, 25) and Hungate (36, 37) which, combined with higher operating costs, forced the majority of these institutions to make drives for funds (60, 64). Marts (42) reported that gifts from corporations, a relatively new source of income, increased and are expected to increase in the future. Bell (6) proposed the establishment of regional agencies to receive and distribute

funds received from corporations. Trent (71) reported on an organization of 31 Negro colleges for cooperative solicitation of funds.

Partly because of larger enrolments after 1945, Reck's study of 124 colleges (64) indicated that expenditures increased 52 percent since 1941. Brown (8) pointed out that nonprofit higher institutions were facing financial difficulties because tuition covered less than 60 percent of the cost per student. Harris (25), Hoff (31), and Reck (64) discovered that salaries of faculty increased less since 1939 than other operating costs but more than costs for administration services. A recent survey by *The New York Times* (60) showed that approximately 20 percent of 648 higher institutions were operating with a deficit as of 1949.

Future Costs

Some estimates of future total expenditures for education were made for the nation by the American Association of School Administrators (2), Dewhurst (18), Linn (41), and the National Education Association (50). The majority of these estimates extend thru the middle 1950's or 1960, the period when public school enrolments are expected to reach an all-time high. In general the Architectural Record (3), Mort (46), Mort and Burke (48), and the Research Division of the National Education Association (54) expected unit costs to increase somewhat and the total cost to the nation to increase a great deal if only prewar standards are attained.

Bearing most heavily on future costs is the number of children and youth to be educated. A great many studies and reports were devoted to future school enrolments and their effects on the total costs of elementary, secondary, and higher education (14, 20, 22, 34, 41, 53, 57).

Wide variations exist in estimates of future costs for higher education, due largely to differing estimates of probable enrolment. The Report of the President's Commission (72) called for an annual expenditure of 3250 million dollars (1947 price level), including capital outlay in 1960 for public and private institutions combined for an estimated 4,600,000 students. This estimate was based on the assumption that all college age population of ability levels of those now in college will attend higher educational institutions. The Twentieth Century Fund Survey (18) estimated an "adequate" annual expenditure of 1435 million dollars (1940 price level) in the same year for 3,600,000 students (including capital outlay) for public and private institutions combined. Newburn (56) noted that increased funds must come from state and federal sources.

Increases in expenditures for educational and auxiliary services, particularly transportation, are expected for the future (2, 55). The number of children transported will undoubtedly increase under the influence of increased enrolment and reorganization of local school districts into larger units, according to studies made by Hutchins (38) and Wochner (75).

Teachers' salaries have lagged behind 1939-40 purchasing power and general wage increases, but were expected to increase slowly. Require-

ments for advanced training, the gradual elimination of teachers with emergency certificates, the upward movement of an increased number of teachers on state and local salary schedules, and the probable further reduction in the salary gap between elementary- and secondary-school teachers were expected by Burke (11) and the National Education Association (52) to increase instructional costs in the future.

Under pressure of anticipated increases in enrolment a great many studies and reports on future building needs and probable costs at all levels—national, state, local—were made (2, 9, 14, 20, 22, 41, 53, 73). Only a few can be specifically referred to here.

The American Association of School Administrators (1), Engelhardt (19), Exton (20), Linn (41), and Studenski and Baikie (70) reported that, in general, building unit costs (per pupil station, per cubic foot, etc.) increased two or three times over the 1940 costs. In recognition of the fact that specific estimates of future building and equipment costs are difficult to predict, almost all studies specified the year of the price level used.

In addition to the tremendously increased expenditures which will be required to provide buildings and equipment for a rapidly increasing school enrolment, certain trends in school building such as larger sites, functionally planned one- and two-story buildings, and modern fixtures and equipment were seen to increase unit costs of school construction (1, 3). On the other hand, the American Association of School Administrators (1) and the Architectural Record (3) reported that research and experimentation in lower cost design and construction are operating to reduce these same costs. On the whole, long needed rehabilitation and replacement of existing structures coupled with new demands were expected to result in very large capital outlays over the next decade or more (2, 9, 14, 18, 20, 22, 41, 53, 57, 73).

Hamon (22) and Linn (41) reported that the amounts required for school building construction for present and expected elementary- and secondary-school enrolments ranged from a conservative 6375 million dollars (1948 price level) thru 1958 to 7400 million dollars (1947 price level) for 1948 needs alone. Dewhurst (18) set the estimate of annual expenditures for school buildings for elementary and secondary education in 1960 for the nation at 708 million dollars (1940 price level) and the American Association of School Administrators (1) estimated the cost thru junior college education to be 1250 million dollars.

Brown and Jung (9) and the California Teachers Association (14) pointed out that the need for greatly increased school building facilities has presented many local school districts with demands for capital outlays quite beyond their fiscal ability and, as a consequence, state sources can be expected to bear an increasing share of school building costs in the future.

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CHAPTER IV

Budgeting, Accounting, Auditing, and Reporting

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THE publication strictly classifiable as research in the fields represented in this chapter are chiefly characterized by their scarcity. The author has now served as a committee member for five numbers of the REVIEW which have dealt with finance and business administration. The story has too often been the same, particularly with the topics here covered. This is regrettable, especially since a thoro canvass of literature in the areas of government and business does not indicate a greater fertility in these fields.

In the course of its inquiry, the chapter committee found and examined about 185 titles on subjects which might have yielded substance. The intention was to adhere to a fairly rigid research criterion. While the reviewing process moved the committee toward leniency in the face of paucity, the residue remaining in the bibliography represents the best that could be found. This could be said at any rate: the most difficult task of the group working on this particular assignment was to find a significant group of studies utilizing research methods and thus worthy of inclusion in the chapter. Where we have gone off "the gold standard," as has often been the case, the deflation may be regarded in part as being for the purpose of illuminating the status of things in these areas and, in part, for the purpose of including a few "insight" articles by persons who are known in research.

Among the most significant of the contributions encountered in this area is the investigation entitled *The Forty-Eight State School Systems* (12). The data assembled in this study are very valuable and useful and the work as a whole will, it is believed, prove stimulating of further research in this and other specialized areas.

Budgeting

Chase and Morphet in their study for the Council of State Governments (12) defined a school budget as "a financial plan which should be so developed as to provide as adequately as possible for educational needs." A good cross-section of informed educational thinking in this area was also set forth by Engelhardt and others (1, 3, 10, 13, 17, 24, 25, 33). During the past three years there has, however, been little or no basic research bearing directly upon the recognized phases of the budgetary process.

¹ With the assistance of George E. Flower, Albert C. Reilley, and Vincent P. Wright, graduate students, Harvard Graduate College of Education.

State Control. Altho the report on the forty-eight state school systems (12) found that most states require some form of school budget for all districts, in many cases only a superficial plan or system had been developed as a normative guide. McLure (26), on the other hand, found a very high degree of state control over the local budgets in Mississippi, especially in school districts receiving equalization funds. He went so far as to say that in such districts "the function that boards of education exercise in approving the budget is largely perfunctory." A slightly different type of centralized control was noted in New Mexico by Brewton (4). Here a county budget commission, composed of the state educational budget auditor and two resident taxpayers appointed by the county commissioners, reviewed local district budgets with the power to disallow individual items. Russell (31) for the American Council on Education pointed out the difficulties arising from inflexible state budgetary requirements pertaining specifically to public institutions of higher learning in Maryland. The case in point had to do with the compulsory projection of budgetary line items up to three years in advance. Cohen (11), using New York, New York, as a typical example, concluded that municipal-educational-state relationships could be simplified thru a better legislative framework.

Budgeting at the Local Level. In approximately two-thirds of the states, according to the study sponsored by the Council of State Governments (12), "the local school officials have full local responsibility for the preparation and adoption of school budgets." In the remaining third of the states, school budgets are subject to the approval of various other governmental bodies. Investigators Chase and Morphet also found that in many states there is no provision for public hearings on school budgets.

Kline (22, 23) determined that in certain Nebraska school districts budget practice fell far short of budget theory as formulated both by the school superintendents concerned and by authorities in school finance. One striking example of this discrepancy was that whereas 75 percent of the superintendents reported that they considered a statement of the educational plan the most important part of a budget, less than 3 percent of these same superintendents included such a plan in their own prepared document. From this study of budget estimates and actual expenditures, Kline (22) inferred that a more detailed approach to the preparation of budgets would decrease the margins of error.

After examining the budgets of three Eastern women's colleges for a ten-year period, Imlah (21) concluded on the basis of comparative per-pupil costs that budget orientation had leaned toward increased expenditure for plant and physical equipment in relation to expenditure for instructional services. This appears to be contrary to much undocumented experience of public school systems—an observation pointing to the need of inquiry. He also found that only two of the thirty-six budget documents examined were so arranged as to permit ready comparison of various income and expense categories with previous years.

Burke (7) declared that annual budgets may have a somewhat stagnating effect because they must of necessity balance an educational plan with available financial resources *for the year concerned*. He reiterated the often suggested advice that budgets include a "supplementary statement of present and future needs" over and beyond those provided for in the regular budget. Burke's concept has a parallel substantiation in the field of public finance as noted in Smithies' article (33). Therein is contained the request for an extraordinary budget to supplement the regular budget.

Accounting

Good (18) reviewed research and other studies in the area of school financial accounting and found very little significant work since the 1920's. He maintained: "This lack of attention . . . has led to a static condition in accounting systems over a period of almost two decades. This situation has prevailed in spite of the protests of many writers that present accounting systems are neither uniform nor adequate."

Uniform Systems of Accounting. Several accounting changes were recommended by the U. S. Office of Education in a revised version of Circular 204, *Financial Accounting for Public Schools* (35). Under Auxiliary Services a new subclassification was added for "Services to Schools Other Than Public," such as compulsory attendance enforcement and transportation. Expenditures for bond elections for new building purposes were to be considered as capital expenditures rather than charged to Administration (General Control). Sales of real property and valuable equipment other than that which is obsolete or junk were to be credited either to current nonrevenue receipts or to capital funds, depending upon whether they had been purchased from the one or the other.

Foster (16) traced the development of federal-state cooperation for improving school accounting over the past forty years. Along with Akerly (2) and Pulliam (30), he reported upon the appointment in 1948 and the continued functioning of the National Committee on the Cooperative Program on School Records and Reports. This committee was responsible for the revised Circular 204 (35) and is currently working on a new manual to replace it. A tentative outline of the proposed manual (36) retained the traditional widely used expenditure classifications, but also included separate sections on cost accounting and the subsidiary records and accounts needed in such fields as insurance, the school lunch program, and student funds. Recognition was also given to the varying needs of school systems at three different population levels: cities over 100,000, from 30,000 to 100,000, and under 30,000, with interest centered on those of 10,000 or less.

Good (18) developed a series of nine criteria for a sound uniform system of school financial accounting and then evaluated 14 state systems in the light of these criteria. He found general compliance with the principles of simplicity and convenience in use, but usually these were

achieved by sacrificing the adaptability and expansibility of accounting records and completeness of essential data. Items not adequately provided for included information concerning payroll deductions, self-supporting or partially self-supporting activities, and the value of property owned by the school district.

The Nevada State Department of Education (28) noted that despite supposed statewide uniformity, classifications of various expenditures varied so widely that it was virtually impossible to compute accurate state totals. The Michigan State Department of Public Instruction (27), in a proposed manual outlining a uniform accounting system, added a "Supplementary Disbursements" category to the standard expenditure classifications, to include such items as loans to revolving funds, payment of principal on short-term loans, and certain community services. The Illinois manual (20), a preliminary phase in the introduction of a uniform system, included a detailed "Alphabetical Classification of Expenditures" particularly for the use of part-time, inexperienced accountants in small school systems. Omitted from this classification were the items of supplies and equipment, the only items usually listed in such state guides, in hope that there would be further classification by the U. S. Office of Education.

Supplies and Equipment. The perennial problem of distinguishing between supplies and equipment led the U. S. Office of Education (35), in view of higher price levels, to raise its 1940 "rule of reason" to a recommendation that anything costing \$10 or more and having a life expectancy of more than ten years be regarded as an item of equipment. Michigan (27) set the dividing line at \$25 and a life expectancy of five years.

Auditing. Brewton (4) recommended in New Mexico that the state comptroller's office be made responsible for an annual audit of the financial records of local school districts and that the state assume the cost of such audit as a matter of economy and efficiency. The study conducted by the Council of State Governments (12) found that about half of the states have some plan for state auditing. The U. S. Office of Education (36) noted the need for greater attention to both external auditing and measures of internal audit control. Brighton (5) surveyed present practices and theories of reliance by auditors on the internal control measures of the enterprises which they audit. The Council of State Governments study (12) concluded that the chief function of an audit is to show whether all funds have been adequately accounted for. "At no time," authors Chase and Morphet said, "should the *judgment of auditors* regarding the desirability of an expenditure for educational purposes be substituted for the judgment of school officials. Such a procedure would tend to give auditors control of educational policies. Audits should show whether all funds have been properly accounted for, whether the district has exercised proper stewardship over its funds and whether any expenditures have been made in violation of specific provisions of law."²

² Italics added by reviewer.

Other studies in the area of accounting included one by Brown (6), who found that suitable payroll records could reduce the monthly payroll entry in the classified ledger to a single line; and File (14), who reported on a plan for handling student funds in the school's central treasury office in such a way that students might participate in a business situation. Finn (15) surveyed federal regulations and court interpretations on depreciation accounting largely from the viewpoint of corporation accounting, but she underlined the fact that the chief problem of depreciation accounting is that of assigning historical cost over successive fiscal periods so that it will be equitably prorated over the total service life of the equipment or building concerned.

Reporting

There appears to have been little thorough-going research during this period in the area of financial reporting. A number of desirable practices and techniques have, however, been presented. A typical sample of public relations articles was presented in the *School Executive* (32). Grimes (19) reported that a monthly budget review for board members served the dual purpose of keeping those members informed financially and enabling them better to evaluate succeeding budgets as they were presented for adoption. Case (8) concluded that the increased cost of wider circulation of an informative annual report was money well spent. Postley (29) advanced the suggestion that professional writers be employed to aid in the translation of statistical tables into clear, concise, yet attractive statements for the lay public.

The U. S. Office of Education (35) stressed the fact that if a true picture of cost is to be given in financial reports, a school system should report on all items common to school systems, even where an item in a given system may be paid for by some other governmental unit: for example, heat or power provided by a municipal department. Brewton (4) found an immediate necessity for standardization and greater accuracy in reporting average daily attendance, especially where such is used as a basis for apportioning state aid.

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CHAPTER V

Problems of Business Administration

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IT HAS been observed that educational literature contains materials which deal largely with educational problems in terms of (a) what has been done, (b) what exists at the present time, and (c) what should be done. Review of the literature dealing with problems of school business administration during the period under consideration leads to the observation that there is practically none of the first category, a little of the second, and altogether too much of the third. If, in reviewing the literature, one abides by the definition of educational research, it must be said that the bulk of what has been published cannot be considered to fall within the accepted meaning of the term.² There appears to be an overwhelming abundance of materials describing the solution of a particular problem, in a particular place, by a particular method. Moreover, there is a full measure of those articles which suggest means and methods of how a certain problem should be dealt with, even tho the suggestions are made without benefit of extensive investigation or supporting evidence. Until those aspects of school business administration mentioned below are dealt with more objectively, improvement of school business administration will be delayed accordingly.

Debt Administration

The available literature contains increasingly frequent references to the inadequacies of our present methods of financing long-term capital improvement programs. Johns and Morphet (39) noted that high building costs, accumulated building needs, bond limitations, and a growing school population have the combined effect of creating a building need of from two to three times the ability of hundreds of school units to finance such needs. The authors argue that equalization of educational opportunities will be difficult to realize unless the states broaden their foundation programs to include state funds for capital outlay.

The Nevada School Finance Survey Group (55) pointed out that methods other than local bond issuance will have to be devised if the Nevada schools are to secure adequate capital improvement programs. The Council of State Governments (16), in describing provisions in the forty-eight states for financing school plant programs, listed twenty-nine

¹ With the assistance of John R. Stinner.

² Research: ideally, the careful, unbiased investigation of a problem based in so far as possible upon demonstrable facts and involving refined distinctions, interpretations, and usually some generalization. Good, Carter V., editor. *Dictionary of Education*. New York: McGraw-Hill Book Company, 1945. p. 346.

construction must come from local sources, chiefly from the property tax. Nineteen states provide some state funds which may be used for school plant construction. This report also summarized state legal provisions existing in 1948 relative to the issuance of school bonds.

The 1949 Yearbook of the American Association of School Administrators (1) noted that the entire problem of financing thru borrowing has changed materially since the 1920's and discussed new approaches to the problem being made in providing state aid for capital outlay in some states. These plans include apportionment of state aid for capital outlay on an equalization basis, equalized matching formulas, state loan funds, accumulation of capital outlay funds from current levies in advance of construction, formation of local nonprofit corporations, and state public school building authorities.

In contrast to the foregoing studies, the chief purposes of which were to develop methods other than borrowing for capital improvement programs, several analyses have been made of procedures by which borrowing can be accomplished more effectively. Johns (38) suggested that financial services of state departments of education should include assistance to local school systems in the issuance and sale of bonds. In states requiring bond issues to be approved by a state reviewing agency, that agency should be the state department of education. Among the 77 school finance goals developed by the Research Division of the National Education Association (53), several pertain to the issuance of school bonds. These goals relate to the period of bond amortization, state approval of bond issues, callable bonds, and debt maturity schedules. Morphet (47) contended that the provision of adequate school buildings means a revision of many state limitations and restrictions so that bonding capacity may be related to actual valuation rather than assessed valuation and so that bonds can be voted when needed without unnecessary handicaps.

Castetter's study (13) analyzed the legal controls and the efficiency of local practices in 40 Pennsylvania school districts in the management of bonds as instruments of indebtedness. On the basis of 18 criteria for judging the educational, economic, and total welfare efficiency of local school bond practices, the study revealed that many unwise and expensive debt service conditions obtain in the smaller school districts, due to lack of comprehensive state controls over borrowing, failure to compel coordination of all local debts, insufficient guidance of local authorities by the state, statutory details which make for insufficient advertising of local bond issues, and ineffective total management of local school districts.

The Council of State Governments (17) concluded with respect to state-local relations that borrowing is an important source of local receipts and that present constitutional and statutory debt limits have many shortcomings. According to the report, loan receipts can be established in their rightful place in the local system thru three courses of action: (a) higher levels of government supporting local credit, (b) replacing current debt

limits by limits that are better measures of fiscal capacity, and (c) extending state supervision of the procedure, amounts, and purposes of local borrowing. Buehler (11) analyzed methods of repayment of loans, as well as problems posed by state and local borrowing. The fundamental principles upon which the improvement of debt control should be based were reviewed by the author. Lutz (45) reviewed state and local debt policies and problems and suggested that legislation governing local borrowing should deal with such matters as limitation of purpose, amount, maturity, proportion of improvement, method of redemption, and obligatory debt service taxation. In a similar vein, Jarvis (36) summarized the opinions of educational specialists concerning state controls which should govern bond issues used to finance school plant construction.

One of the laudable developments in the field of public school debt administration is the increased emphasis on long-range financial planning. Dotter (21) contended that the financial plans of many school districts are simply to spend their incomes. The author recommends that before bonds are issued, intensive study should be made of the social and economic factors which may affect long-term indebtedness. The need for capital improvement planning on a long-term basis is treated in a variety of sources, the most noteworthy of which are the publications of Furlong (25), the International City Managers' Association (32), the Municipal Finance Officers Association (49), and Roberts (61). In discussing the planning of financial aspects of the plant program, the American Council on Education report (2) urged wider capital outlay financing from current revenues and stressed the need for more state and federal financial assistance for the construction of public school facilities. Linen (43) discussed the marketing of state and municipal bonds in terms of the factors which affect marketability. Both money and price factors are analyzed, the objective of which is to indicate the bearing which money supply, tax exempt securities, supply and demand, bond ratings, taxing power and limitations, market trends, legality of bond issues, and public confidence have on the interest rates which a municipality must ultimately pay for its bonds. Sears (66) raised certain questions which must be dealt with by school districts in connection with the use of public credit and discussed briefly the social and economic implications of debt financing.

A number of useful articles, manuals, and textbooks have appeared in the literature dealing with practical technics of school debt administration. While none of these can be classified strictly as research, they represent the views and experiences of school administrators and financial specialists, as well as municipal and banking institutions interested in the improvement of debt administration. These materials should prove helpful to school administrators faced with the numerous problems involved in debt administration. The major factors to be dealt with by school and municipal officials in administering bond issues were taken up by Castetter (14), Ellinwood (23), the International City Managers' Association (32), Mul-

ford (48), the Municipal Finance Officers Association (50), and Tenner (68). These factors include long-term financial planning; debt maturity schedules; issuance, marketing, and service of bond issues; sinking fund administration; and legal aspects of bonding.

Chatters and Tenner (15) presented procedures employed in accounting for bonded debt, sinking fund administration, financial reporting, and amortization of bond discounts and premiums. Tenner's text (68) on municipal utilities contained a useful discussion of technics to be employed in registering bonds and interest, paying bonds and interest, filing cancelled bonds and coupons, and the selection of securities for investment. Hart (28), the Investment Bankers Association of America (35), and Prime (59) have developed mathematical procedures for determining bond yields. The latter reference is especially helpful in indicating the manner in which straight and split-rate bids on bond issues may be computed.

Both the practitioner and the student of finance may wish to refer occasionally to several important source books. These include the Bond Buyers' directory of municipal bond dealers and municipal bond attorneys in United States (8); the *Municipal Yearbook* (33), which reviewed trends in municipal finance; a textbook on the technic of municipal administration (34); *Moody's Manual of Investments* (46), an annual publication containing financial statistics and bond ratings of state and local units of government, including school districts; and a publication of the Educational Research Service (52) relating to methods which have proved successful in conducting campaigns for public support of school bond issues.

Transportation

The increasing importance of pupil transportation due to the redistricting that is now taking place in about a third of our states was pointed out by Butterworth (12), while Cyr and Darland (18) indicated the broadening scope of pupil transportation with increased use of school buses for class trips, field trips, and excursions.

Zimmerman (75) suggested that the study of pupil transportation costs can be approached in three ways: (a) comparing each unit in the district with "average practice" in the district, (b) measuring the need for transportation in terms of some factor such as density of population, and (c) a controlled-experiment method in two districts. Butterworth (12) stressed the need for comparable data in the study of pupil transportation costs, while Davis (19) urged standardization of components which go to make up pupil transportation costs. Stapley (67) found that the following factors affect the cost of pupil transportation: (a) size of unit, (b) routing, and (c) methods of operation. Similarly, Davis (19) listed the following as basic components which go to make up pupil transportation costs: (a) drivers wages, (b) operation and maintenance, (c) depreciation of buses,

(d) depreciation of garage and equipment, (e) insurance charges, (f) district's contribution to employees retirement, and (g) administration costs.

The question of state aid to the districts for pupil transportation has given rise to several proposals for reimbursement. Johns (37) proposed a formula for allotting state aid, based upon road conditions and number of riders per square mile. The value of the constants in the formula were calculated for Florida, but can be calculated for any state. Zimmerman (76) proposed a reasonable cost method for allotting state monies for pupil transportation in Maryland. The proposed scale to determine reasonable cost of pupil transportation was based upon seven items: (a) depreciation of cost of bus, (b) interest on initial cost of bus, (c) salary of drivers, (d) other fixed costs, (e) cost of oil, gas, lubrication, and anti-freeze, (f) cost of tires, and (g) cost of maintenance. Two plans for equalizing the cost of pupil transportation in California were presented. Gilles (27) proposed a plan for equalizing the costs of pupil transportation based upon reasonable cost of providing such service by means of district-owned buses, while Bryan (10) recommended a plan for equalization of state aid for pupil transportation based upon actual approved costs of providing such transportation in the district and the uniform effort in each district. Gilles (27) found that the cost of pupil transportation in California had risen more than average daily attendance or state apportionment for transportation.

The present legal status of transportation insurance in the various states was described by Booker and Remmlein (9). A further study by Remmlein (60) pointed to the need for legislative classification of the problem of liability for school accidents. Featherston (24) stated that national standards have been set up for school buses and that about three-fourths of the states have adopted these standards in whole or in part.

Cyr and Darland (18) stated that bus drivers are usually considered full-time employees, but work seventeen and one-half to twenty hours per week and they noted a trend toward employing part-time drivers, high-school students, and housewives. The establishment of driver standards as a state and local responsibility was emphasized by Belknap (7), who also stated that schools must make up for any lack of training or experience on the part of its school bus drivers. Stapley (67) concluded that selection, training and supervision of school bus drivers results in better transportation. The nationwide survey conducted by Rosenstengel and Swiers (64) revealed that the school business manager is responsible for the administration of pupil transportation in 48 percent of the districts.

Economies in pupil transportation have been given increased attention. Butterworth (12) stated that the meager evidence available pointed to the large district as most economical for pupil transportation. Stapley's study (67) in Indiana showed that district-owned buses were the most economical, that jointly owned buses were next in economy, and that privately

owned buses were least economical. Gilles (27) found that the unit cost in San Diego County, California, for 1945-46 were higher in districts which contracted with private carriers than in districts which operated their own buses. The trend toward the school district ownership of school buses was suggested by Zimmerman (75). Stapley (67) showed economies to be realized in school ownership of school bus garages. His study also indicated that shorter routes were the least economical. Robinson (62) emphasized the need for careful appraisal in laying out bus routes.

Purchasing and Supply

An editorial in the *American School Board Journal* (4) stressed the importance of the school purchasing agent and called for a man who is education-minded, has leadership and organization ability, and has the ability to develop policies and methods of buying that are adjusted to changing business conditions and public interest. The duties of the school business manager were portrayed by Rosenstengel and Swiers (64).

The question of who should make the selection of school purchases has received attention in the literature. George (26) suggested that a general committee of all school personnel be utilized to study supply and equipment needs. The *Nation's Schools* (54) reported that the methods used by various schools for buying perishable foods for school cafeteria were: (a) cost plus, (b) open competition, and (c) judgment of cafeteria managers. The *School Executive* (65) reported the results of a survey of superintendents to determine purchasing habits indicated that the user of supplies usually selected the supplies. Rosenstengel and Swiers' survey (64) of school business managers indicated that 82 percent of the business managers purchased all educational, operational, and maintenance equipment. The importance of centralized clearance of requisitions of supplies was stressed by Hunt and Clark (31), and Barbour (6) noted economies thru centralized buying.

The sources of specifications were pointed out by Holm (30), who listed the main types of specifications and the circumstances under which they can be used. George (26) suggested that schools utilize the information available for selection of materials by research laboratories of school supply companies and educational magazines. Rosenstengel and Swiers (64) found that 71 percent of the business managers surveyed made the specifications for all supplies and equipment.

Hunt and Clark (31) suggested the use of a supply-per-capita utilization budget and that educational equipment quotas be set up by the educational personnel. Barbour (6) indicated that larger administrative units appear to be more economical and described the following example: In 1948, North Carolina purchased 500 school buses thru the state purchasing commission for \$2650 each. These would have cost the individual districts \$3500 to \$4000 if bought individually.

A cooperative purchasing plan was reported by Kautz (41) in use in

the Cincinnati area where the board of education, city, county, and public library, and the University of Cincinnati coordinated their purchases. The benefits of the plan were: (a) monetary savings, (b) improved service to purchasers, (c) cooperation on the part of governmental purchasing agents to solve mutual problems, and (d) improved relationship with vendors due to standardization of forms and consultation on problems. Purchasing savings thru centralized authority, simplification, and standardization were suggested by Yerge (74). Murray and Holzapfel (51) stressed the importance of proper management of supplies and repairs thru (a) adequate personnel, (b) adequate and centralized storage, (c) scheduled delivery, (d) establishment of receiving and delivery points, and (e) constant repairs of school equipment.

Little (44) constructed a school supply purchasing practices score card which was originated for use in Kentucky but apparently could be used elsewhere. It is used for the rating of relative efficiency of performance of the purchasing function in the purchase of school supplies by individual districts. The score card has 15 weighted divisions. A checklist for each division was provided.

Insurance

Upton's study of fire insurance costs and practices in city-school districts (69) is an eight-year study (1938-1946) primarily of cities over 20,000 in the United States and Canada. The principal findings are: (a) Trend of fire insurance rates is downward. Rates are 12 percent less than 1930-31 on coverage 5 percent higher in 1938-1945. The most common cause for rate reduction was the reduction of fire hazards. (b) If companies had reduced rate by 40 percent during the eight-year period, 1938-1946, the loss ratio for city schools would have been the same as that for all risks in the country as a whole. (c) The trend is toward the use of a five-year term insurance policy. The blanket coverage of school property is most common and the use of co-insurance was almost universal. A method for developing an insurance form for a school district was also presented by Upton, and he developed a standard form for use in California school districts.

The increasing complexity of purchasing school insurance was pointed out by Joyner (40), who contended that it is no longer a simple task of ordering a policy from some local agent. He stated that the cost of replacement of school buildings has risen but questions if the fire insurance coverage has risen sufficiently. How to plan an insurance program was presented by Eichler (22). He emphasized the importance of an experienced insurance broker in the writing of policies, inspection of buildings, and in fire prevention. The survey of Rosenstengel and Swiers (64) has shown the importance of the school business manager in the appraisal of school buildings for insurance and in the purchase of insurance.

Booker and Remmlein (9) studied the present legal status of transpor-

tation insurance in the various states. Remmlein (60) called for the need for legislative clarification of problems of school transportation insurance. The trend toward making all government bodies liable for negligence was noted by Joyner (40). Rosenfield (63) discussed the question of statutory liability in relation to school accidents. The Educational Service Bureau of the University of Pennsylvania (57) conducted a statistical survey on transportation insurance in nine suburban Philadelphia school districts.

Personnel

A survey of school custodial personnel in the spring of 1946 in cities above 30,000 population was conducted by Phay (58). He found that the emoluments, rights, and privileges, of custodial personnel varied greatly. The typical custodian reported by this survey worked about forty-eight hours a week and received an annual salary of \$1950. This was an increase of \$300 over 1942-43. The typical custodian was not a union member and received less pay than did a union custodian. Phay (58) recommended that custodians be employed on an eight-hour day and forty-hour week and called for establishment of administrative policies concerning custodial personnel. The study indicated that custodial personnel practices must be improved to attract career custodians. A statistical study, similar to Phay's, of nine suburban Philadelphia school districts was conducted by the Educational Service Bureau of the University of Pennsylvania (56).

Knoll (42) reported on the nonteaching personnel practices in Long Beach, California, Public Schools, which call for high standards and provide good pay. Long Beach approached the salary study as a joint affair with a city-employed salary consultant. The nonteaching personnel in Long Beach preferred school organizations to labor unions.

With the conviction that poor custodial service is costly, Viles (70) recommended preservice training and inservice training. He presented a flexible program to meet the needs of training the custodial staff. Stapley (67) recommended a training program for school bus drivers as a method of providing better school transportation.

Rosenstengel and Swiers (64) surveyed the responsibilities, duties, training, and experience of the school business manager in cities of various population groups in the United States in 1947. Their data indicated that the position of school business managers is of such importance that professional work should be offered for training as business manager. The importance of school business personnel has also been stressed by other writers (4, 5).

Other Auxiliaries

Walls (71) reported that children are still not favored in securing dental appointments. Since the ratio of dentists to population is decreas-

ing, he suggests the use of chair assistants to increase the service of the dentist. A similar plan was reported by Holder (29) to be in use in Richmond, Indiana, in which dental assistants who had ten weeks training were utilized. Walls (71) also suggested the establishment of a school dental service similar to that found in New Zealand, in which graduate school dental nurses with three years training were utilized. The chief hindrance to such a plan was the lack of any state board to license such nurses.

Holder (29) gave a progress report on the Richmond, Indiana, pilot dental study. One of the functions of this study was to determine the annual dental care needs of school children on an annual increment basis.

The Astoria Plan of school medical service was evaluated by Yankauer (3, 73). This plan calls for continuity of record keeping and for a yearly conference with teacher and nurse in which the health of the pupil is reviewed. Yearly routine health examinations are eliminated. He reported that only minor, uncared-for physical defects were observed and that the Astoria Plan functioned satisfactorily in the schools surveyed.

Wayland (72) emphasized that school health is a function of all the schools and not of just the health departments. He stated that adequate funds were needed to support a good health program.

The Denver, Colorado, Study Committee of School Nurses (20) reported on a survey of nurses' salaries and conditions in thirty-eight cities over 100,000 in 1946. The report indicated a wide variation in salary, working conditions, and pupil load and slight variation in the educational requirements for school nurse.

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CHAPTER VI

Review of Developments

FRANCIS G. CORNELL

CONTRIBUTORS to this REVIEW have observed, as have authors of earlier numbers, that not only is it difficult to locate literature which is strictly acceptable in terms of research criteria but it is also extremely difficult to exclude material which does not meet these same criteria. This committee has found it necessary to include the latter type items either because these writings provide the only sources of significance dealing with the problem under review or because of an unusual line of reasoning on the subject, in most cases from an authoritative source. These we may call marginal references in the field. It is unfortunate that research properly defined is so limited in this area that it is necessary to depend upon many of these marginal sources.

Marginal Research—Publication as Communication

There are other bibliographical items in this issue which may be classed in the marginal group. These are publications the chief purpose of which is *communication*. They are conceived not so much in terms of the substance reported, but in terms of the way it is reported and the audience which is to be reached. In this class would be included a number of publications of the National Education Association on subjects of finance. An example of popularized reporting, tho on a subject based on research, is the publication, *Still Unfinished—Our Educational Obligation to America's Children* (8).

During this period specially prepared popular digests have been released as supplements to basic surveys or commission reports. Examples are the digests written by the National Commission on the Reorganization of School Districts (7) and the Florida Citizens Committee on Education (2). Noting the frequency with which such types of publications appear, it would seem that this development, tho evidently dealing with a more or less marginal classification of research, marks the maturing of research in the field, at least in the sense that it is coming to be communicable to interested persons.

That research literature in finance and business administration is giving way to publications which will more appropriately broaden the base of professional and lay understanding of school fiscal problems is not altogether regrettable. It is, on the other hand, unfortunate that so little basic, fundamental, rigorous, scientific research has appeared during a period when the pressure of school finance problems has resulted in so many state surveys and other "action" publications.

Marginal Research—Engineering and Action

As the foregoing suggests, the period was characterized by an increase in the number of evidently high caliber statewide applications of research. Some of the state surveys emphasizing finance have been reported in this volume because of unique developments presented in them. From the standpoint of producing new ideas, new methods, new technics, and improved theory or understanding, these, for the most part, must also be classed as "marginal" items in a research review. That work in this area is becoming more and more action-oriented is to be viewed with favor from the standpoint that the vast engineering tasks in the improvement of educational finance and management need attention. Yet, again, this is not building a science, despite the advances in practice which it produces.

Data-gathering studies may be essential in action-oriented engineering programs on local, state, and national levels, but useful new generalizations which come from these studies are usually ancillary to the action objective. With reference to a specific legislature or action group, it may be important that facts be presented to show: (a) that more money is (or will be) needed for schools; (b) that some school districts (counties, states) have more financial ability (or spend more for schools) than others; (c) that property, the chief object of taxation in support of schools, is not equitably assessed and anyway cannot produce revenues needed in some areas; (d) that sources of support formerly of major significance (such as local taxes for public schools, endowments for private colleges) are not sufficient for the support of schools and must be supplemented by other revenue sources; or (e) that inefficiently organized districts (or schools) either fail to make possible good educational programs or are uneconomical. It is not, however, with ridicule that the writer points out that this slight exaggeration of what is necessary for action is melancholic prose to the researchist seeking new principles and new inspiration.

Research in the Most Literal Sense

Aside from the marginal items reported in this number and referred to above, there are two types of fundamental research which are covered in this REVIEW. One of these classes of study deals primarily with the development of *technic*, the other is directed toward *summarizing developments* in some broad or more or less delimited aspect of finance and business administration.

Examples of studies directly geared to the solution of old problems or to the solution of new ones by the development of new technics are those by Hungate (3), Lindman (5), McLure (6), Sargent (15), and Strevell (17). One of these is a frontal attack on the financing of higher education, another on financing capital outlay. Tho they may be classed as research studies in the most literal sense, they nevertheless deal with subjects of

immediate significance. While it is encouraging to note that more or less fundamental researches of this type have continued thru the three-year period covered by this number, some concern may be registered for what appears to be a much greater emphasis on other types of literature. This threat may disappear, however, if another observable trend continues, namely, the development of basic researches in conjunction with application or action studies. The West Virginia survey (16) and the studies in the state of New York (13) are illustrative of this development.

Comprehensive Inventories

It has been within only the past two decades or so ago that we have begun to have, thru the Research Division of the National Education Association and thru an intensive study, the National Survey of School Finance, a systematic stock-taking of theory and practice in the field of school finance. During the period reviewed in this number, several such reviews or recapitulations have been made. Many of these appear in connection with reviews by professional organizations of major educational problems. For instance, the yearbooks of the American Association of School Administrators which are devoted to such topics as school building construction contain sections summarizing contributions of the field of finance to the solution of such problems. Likewise, special commissions attacking a special problem—such as the Commission on the Reorganization of School Districts—analyze, review, or synthesize the financial aspects of the problem. This issue of the REVIEW of course, serves the same end. Occasionally, individuals, such as Quattlebaum (14), prepare a digest of arguments on an issue like federal aid. Several articles published by individuals have tended to summarize the status of thinking on several topics covered in this REVIEW. Perhaps one of the most needed types of research during a period of very rapid change in the nature of financial problems and ways of solving them is the descriptive reviews of the status of practice, such as those prepared by the Research Division of the National Education Association (10, 11, 12) and, recently, by the Council of State Governments (1). There is some evidence that students of these problems working on commissions, committees, and survey groups are attempting, along with factual description, to develop new understandings, new meanings, new perceptions. A direct attempt to examine the common set of understandings applicable to all states regarding state finance systems was the goal of the NEA Committee on Tax Education and School Finance (9).

Research and Engineering in the Balance

It is encouraging to see some of the ideas produced by research within the past quarter century becoming more widespread and more effectively used in bringing about improvements in practice. It is also hopeful to see fundamental research continuing in the field of finance and business admin-

istration. The improvement of practice is urgent, but so is basic research urgent, since the practitioner in many respects is still forced to make many arbitrary decisions in this field. The shortcomings of literature reviewed in this REVIEW seem to be on the basic research end. There is need for studies in scope and in perspective as comprehensive and as thorough as that by Johnson (4) which dealt with a much broader problem than educational finance. Glaring new problems seemed not to have had the attention of the researcher. It is surprising, for instance, that so little attention has been given to the problem of revenue for schools at a time when changes in our taxation and debt structure so obviously call for new perspectives. This seems particularly pertinent to this period during which so much has been written on how money should be spent and how badly more funds are needed.

On the credit side of the ledger are points, most of which have been noted by the NEA Committee on Tax Education and School Finance (9). The NEA Committee's conference report saw school finance problems coming to be tackled from a dynamic and a developmental point of view. The trend toward relating research to action is not new to the period covered by this REVIEW, but a number of research items covered in this number include directly or are intended to involve lay participation or make reference to the necessity of lay involvement in order to effect change. It seems reasonable to assume that as larger numbers of people become informed and participate in the study of school fiscal problems the demands upon research of all types in the field will be greater.

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Index to Volume XX, No. 2

Page citations are made to single pages; these are often the beginning of a chapter, section, or running discussion dealing with the topic.

- Accounting, 135; financial, 137; supplies and equipment, 138; systems of, 137
- Appportionment, of school revenues, 109
- Auditing, 135, 138
- Bonds, 143
- Budgeting, 135; state control, 136
- Building costs, 125
- Building needs, 125
- Bus drivers, 146
- Business administration, 115, 142
- Capital outlays, 110, 142
- Costs of education, analysis, 124; buildings, 125; estimating, 109; higher education, 128; inequalities, 124; per pupil, 124, 127; predictions, 129; and quality, 126; trends, 124; units, 127
- Custodians, 149; inservice training, 149
- Debt administration, 142
- Dental services, 149
- District reorganization, 115; criteria, 116; and economy, 120; methods of achieving, 117; needed research, 120; obstacles, 118
- Federal aid, 107
- Finance, school, 105, 142; planning, 108; and reorganization, 115; state foundation programs, 108
- Health programs, 150
- Higher education, cost, 128; financing of, 107
- Insurance, school, 148; transportation, 148
- Local surveys, 119
- Medical services, 150
- Nonteaching personnel, 149
- Personnel, nonteaching, 149
- Property taxes, 105
- Purchasing supplies, 147
- Reorganization, of school districts, 115
- Reporting, financial, 135, 139
- Salaries, of teachers, 125; of custodians, 149
- State support of education, 106, 146
- Supplies, accounting, 138; purchasing, 147
- Support of education, 105; economic, 105; federal, 107; local, 105, 111; measures of ability, 111; by states, 106
- Surveys, local, 119
- Taxes, for support of schools, 105
- Transportation, costs, 145; insurance, 148; legal status, 146; state provisions, 146

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FOREWORD

THE editorial board planned that this issue of the REVIEW include the areas covered in two of the issues of the 1947 cycle. The two issues were titled, respectively, "Education for Work and Family Living" and "Education for Citizenship." "Education for Leisure" was then added and the title "Education for Work, Citizenship, and Leisure" given to this issue.

Due to illness of one of the contributing members of the committee it became necessary to omit the chapter on "General Education." However, some aspects of it are included in the chapter on "Social Studies." "Adult Education for Citizenship" is also omitted as a separate chapter in this issue.

JOHN A. WHITESEL, *Chairman*
Committee on Education for Work, Citizenship, and Leisure

CHAPTER I

The Social Studies

RUSSELL H. BROADHEAD and STANLEY E. DIMOND*

FOUR trends were apparent in the nature of the research completed during the three years covered by this REVIEW: (a) an increase in the number of doctor's theses, (b) the thoroughness and penetration of the research as a whole, (c) the more liberal financing and consequent improvement in continuity of several studies, and (d) the expanding role and focus of the social studies program.

Social education has become a subject of increasing concern to educators. This concern was reflected notably in the following special studies: the Americanization Project of Stanford University (21, 63, 119), the Citizenship Education Study of the Detroit Public Schools and Wayne University (20, 22, 24, 32, 78, 129), the Civic Education Project at Harvard University (36), the Cooperative Study in General Education (64), the Kansas Study of Education for Citizenship (52), the Miami Experiment (96), the *New York Times* Current Affairs Survey (26), the Open-Mindedness Study of the Philadelphia Public Schools (98), the Palmer Foundation Studies (115), the Sloan Foundation Project in Applied Economics (35, 44), the Stanford Social Education Investigation (100), the Syracuse Citizenship Program (46), and the recently announced citizenship project at Teachers College, Columbia University (111).

History of the Social Studies

Alilunas (2) investigated the background of the rise of the "new social studies" in the American secondary school and, at the same level, explored some of the major controversies within the field (4). Holland (45) traced the history of the social studies in Michigan thru an analysis of legal factors affecting instruction in the field. New data were added to the history of civics as a school subject by Nietz and Mason (91). Arguments for and against the use of the source method of teaching during the 1890's were reviewed by Keohane (55).

Curriculum

The growing inclusiveness and integration of the curriculum of secondary schools have posed a dilemma for those in the social studies field: Should the social studies be limited to those areas from which they were historically derived, or should their scope be widened to encompass new

* The authors are indebted to Albert Morris, graduate student, Wayne University, for assistance in gathering references.

areas and functions? A major contribution toward the latter perspective was made during this period by Quillen and Hanna (100), who defined the term "social education" as "all educational activities under the direction of the school which have as their purpose the improvement of human relations, thus recognizing that all teachers and administrators have social-education responsibilities." The Stanford Social Education Investigation (100) implemented this approach in its formulation, content, procedures, and personnel. The inclusiveness and interrelatedness of the social studies within the total curriculum are borne out by this report, as well as by such contributions as *Developing A Curriculum for Modern Living* by Florence Stratemeyer (120).

One of the forms of curriculum integration which received increased attention is general education. At the junior-high-school level, Mudd (86) reported the procedures, technics, and materials used in a countywide core program in Maryland. Noar (92) did likewise for a similar program in operation in Philadelphia. Faunce (39) examined and analyzed core programs in eight Michigan secondary schools, covering a ten-year period. Alberty (1) dealt in some detail with the history of, reorganization procedures for, and teaching technics involved in high-school core programs. The growing interest in general education in the social studies at the college level was reflected in surveys and descriptions of experimental programs by Levi (64), Light (66), McGrath (73), and Sprague (118).

Offerings

In a cross-sectional study of 449 secondary schools made during 1946-47 by the U. S. Office of Education, Anderson (5) reported on registrations in and characteristics of conventional social studies courses. Most pupils tended to take two years of social studies in Grades VII and VIII, while those in Grades IX to XII took somewhat less than three years. In more than 90 percent of the schools, pupils were required to take one year of United States history in Grades VII or VIII and another year during the last four grades. Comparing these data with the results of a similar study conducted during 1933-34, he reported that United States history instruction had increased markedly at both levels. Young's study (135) of the social studies in Texas high schools revealed that world history and world geography led in newly added courses.

Studies in Separate Subjects and Broad Fields

In a study of trends in American history teaching in senior high schools since 1890, Willis (132) noted increased attention to social and economic history since the Civil War and to international relations. Moorman's investigation (83) of basic economic concepts in the high-school curriculum, based upon an analysis of high-school and college textbooks, indicated that authors disagreed as to which concepts are essential. Tests given economics

students showed that a large percent lacked understanding of concepts. In the field of consumer education, Briggs (15) found in responses from 725 high schools that 26 percent had separate courses and that the field was a part of other courses in 87 percent of the schools. Approximately the same percentages were reported by Lipstreu (67) in his 1948 survey of 206 senior high schools. He concluded that consumer education seemed to be entrenching itself slowly but surely as an integral part of the core curriculum. In a survey of geography covering elementary and secondary schools in thirty-four California counties, Cole and Pontius (23) reported that most of the elementary and junior high schools and 50 percent of the senior high schools believed that geography should be taught as a part of a social studies course. In his study of conservation education in the secondary schools of the United States, Will (131) noted the trend toward the regional approach, the successful cooperation between state education departments and conservation agencies, and the need for a many-sided approach to the field. The 1948 Yearbook of the Association for Supervision and Curriculum Development (87) surveyed the trends, purposes, practices, and problems in conservation education. Wievele (130), in his study of the attitude toward and knowledge of conservation possessed by students in Iowa high schools, found that students who had taken a greater number of courses in the social sciences had slightly more favorable attitudes and made slightly lower scores on the general achievement test in conservation. West (128) surveyed the history and present status of the twelfth-grade problems of democracy courses. Surveying 181 school systems regarding the teaching of contemporary problems on the twelfth-grade level, Babcock (8) reported that this course replaced special courses—civics, economics, and sociology—in 49 percent of the schools. In a similar study, Knapp (62) emphasized the importance of adequate materials and well-prepared teachers who participate in community activities.

The Community and Social Studies

The role of the community in the social studies continues to be a topic of concern and research. The Sloan Foundation's Project in Applied Economics has continued its efforts in community-focused education. Hillis (44) reported on the preparation and evaluation of instructional materials on community agencies as a part of the Sloan Experiment in Kentucky. Durrance (35) described experimental programs of school-community cooperation as part of the Florida project. Olsen (93) compiled and edited a casebook of illustrative school and community programs at all levels of education. Duncan's study (33), based upon a survey of forty-seven North Carolina high schools and the responses from eighty-seven authorities, concluded that the study of community resources should be integrated with existing subjectmatter rather than be fashioned as a new discipline. After a study of selected community problems, Wool-

ston (134) recommended possible revisions of the social studies program for a Rochester, New York, high school. Cash (18) surveyed school-community relations in selected high schools in eastern Texas. At the junior-college level, Bottrell (12), after a study of the organization and supervision of services to the local community, discovered that reported programs had relatively indirect reference to the educational program of the junior college and that the most common patterns of organization of community service programs were the casual, the special-occasion, and other loosely organized types.

Contemporary Affairs

The *New York Times Current Affairs Survey* (26) concluded that successful current affairs teaching was found where administrators and teachers were using the varied and abundant resources of the community in a balanced and integrated program. Kinney and Dresden (57) found that classes stressing current affairs achieved at least as well in recognized subject outcomes and were superior on information regarding current events. Rogers (106) studied the handling of controversial issues in two Southern cities and found that the temperament of individuals was a greater cause of timidity than was criticism from administration or community. Van Hoesen (126) found that schools using a booklet, a letter urging registration, or a combination of these methods got out a better neighborhood voting record than did comparable school neighborhoods which did not use these materials.

Neglected Areas

Areas of neglect and need within the social studies were the subject of several researches. In Romine's study (107) of educational theory and practice as related to public secondary-school curriculums, six of the ten most neglected areas directly or indirectly concerned the social studies: cultivation of scientific thinking; love, sex, and courtship; family relationships for boys; the Far East; Russia; and labor-management relations. Crawford (27) studied the curriculum preferences of thirty-eight groups of junior and senior high-school and college students. In a list of ten subjects, social studies ranked fifth among boys and eighth among girls. Students preferred topics related to familiar fields of experience and those which promised them help in learning to perform those tasks or activities in which they would have occasion to participate in everyday life. Hunt (48), after analyzing the teaching of economics in the American high school, concluded (a) that much of the economic content of the process and (b) that many of the most crucial issues of modern civilization are not given an effective treatment in the economic content of the high-school curriculum.

Ways of Organizing the Social Studies Curriculum

During the three-year period here being reviewed, several researches into ways of organizing the social studies curriculum were produced. Kinsman (58), basing his study upon writings of leaders in education and reports from learned societies, as well as on the examination of representative and experimental curriculums, concluded that the social studies at the secondary level had few issues upon which there was agreement either in theory or practice. This finding was confirmed specifically in relation to continuity and sequence by Sand's study (109) of these two organizing elements. Analyzing four social studies guides for four school systems, together with fifty-four teacher interviews and 127 classroom observations, he concluded that there was no evidence found in the guides of any adequate appraisal of organizing principles. Curriculum structures in the schools studied had been selected in terms of personal preference or custom. Bradfield's survey (13), covering secondary social studies in thirty-four states, likewise indicated the need for more attention to sequence and to agreement upon standards in curriculum making. Utilizing the case-study method thru interviews and observations in twenty-six schools, Klohr (61) studied the role of the resource unit in the curriculum reorganization of secondary schools. He discovered (a) that resource units were not being extensively used, (b) that they were most widely used in general education areas, and (c) that their use had been a significant factor in the curriculum reorganization. Addressed to the problem of grade placement, the report by Klee (60) on an experimental four-week unit with a fourth-grade class on "Community Life in China" indicated that the study of far-away places and persons was adaptable to that grade level.

Resources

Several studies were made of social studies textbooks. Quillen (99) reviewed the studies of contents of textbooks as they affect international understanding. A survey of national history textbooks used in the schools of Canada and the United States (17) revealed mutually unbalanced treatment and inadequacies of content. An analysis by Robinson (105) of Canadian-American relations in American history textbooks indicated a factually accurate tho distorted picture of our northern neighbor. McClure (72) examined forty-seven social studies textbooks published between 1945 and 1949 to discover the treatment given atomic energy. She found that adequacy of treatment varied enormously from book to book and was, in most cases, open to question. Alilunas (3), investigating ethnic and linguistic interpretations of Lithuanians in fifty-three American textbooks, concluded that nearly all failed deplorably to apply scholarly standards. In a similar investigation, Saveth (110) found evidence of racial and national bias toward American immigrants in social studies textbooks. Spieseke (117) compiled bibliographies of social studies text-

books published between March 1939 and December 1949. Street (121) analyzed the school edition of the *Reader's Digest* and found that it was not a "forum" thru which any great variety of ideas and viewpoints on controversial issues got expression.

Selected and recommended courses of study, guides, and resource units were presented by Meredith (79, 80) for the senior high school and the junior high school and by Hill (43) for the elementary school. A group of California school supervisors (16) compiled a list of American folk songs, grouped on three levels of difficulty of learning. Kenworthy (54) compiled an annotated bibliography, grouped by topics, nations, and problems of materials on world affairs for teachers. Logasa (69) brought out the fourth edition of the annotated bibliography on historical fiction and other reading references for classes in junior and senior high school.

Thinking

The importance of teaching critical thinking or problem solving has been emphasized as a key objective by social studies leaders for a long time. The values of this type of teaching were demonstrated experimentally by several investigators. The Stanford Social Education Investigation (100) concluded that high-school students using the problem-solving approach not only made significant growth in more aspects of critical thinking, but they also demonstrated superior ability on every behavior evaluated by the *Nature of Proof Test* than did similar students not using this approach. They also made superior improvement in work habits, study skills, and library and research technics. Peters (96) concluded that education of the democratic-action-centered type was equally or more effective in securing academic masteries than was the conventional type of social studies teaching in high-school American history, civics, or sociology. Moreover, the DAC methods were more effective than conventional methods in preparing pupils to apply their knowledge to meaningful relations and in affecting their habits and systems of values.

Kight and Mickelson (56) in a comparison of problem-centered and subjectmatter-centered units of instruction found that secondary-school pupils learned more factual information in connection with the problem-centered presentation and that they also learned more rules of action. These findings were true both for pupils of high and low intelligence and for boys and girls. Metcalf (82) found that it does not advance the conceptual learning of the student for the teacher to confine his activity to telling the student which of his beliefs are true. The student must determine thru a process of problem solving what is true in order for conceptual learning to occur. With college freshmen, Fersh (40) found an inconclusive difference in social beliefs between the problems approach and a traditional history course, but there was more consistent improvement in thinking skills from the problems approach. A strong relationship was found between the pattern of social beliefs of an instructor and the

changes effected in students. Charters (19), in a study of twenty-one adult classes participating in the Great Books Program, found a consistent, but not statistically significant, development of five abilities involved in thinking.

Altho teaching for critical thinking is supported by experimental evidence, two studies emphasize that the procedures have not permeated far into the general practice of teachers. The Kansas Study (52) reported that presentday students make little progress in developing the abilities of critical thinking during the high-school years. Lewis (65) reported that observations of good teachers in fifth-grade social studies classes showed that solutions to problems were usually judgments of teachers. Children participated for the most part in teacher-planned and teacher-guided activity.

Assistance to teachers desiring to teach for critical thinking was provided by R. L. Thorndike (90), who reviewed the principles and techniques of problem solving. The Detroit Citizenship Education Study (20) prepared a detailed outline of the problem-solving process. The Open-Mindedness Study of the Philadelphia Public Schools (98) showed how one school system attempted to improve pupils' ability to think. Jewett (49) demonstrated how historical evidence can be employed for the promotion of reflective thinking.

Teaching Democracy

The conflict between democratic and totalitarian ideologies had an impact on the research during the three-year period under review. Clarke (21) found that eleventh-grade students accepted the "American ideals" as a way of life in which respect for the inherent worth of the individual was the keynote. He concluded that those who define democracy solely as political democracy will not find support in student beliefs. Stone (119) developed materials for teaching these ideals to elementary-school children by developing a group of problem stories based on typical statements from nine historical documents. These stories were left unfinished and classes worked out solutions. Altho teachers tended to channel discussion, pupils developed insight into cause and effect relationships and the ability to generalize. Shaftel (112) employed the sociodrama technic as a teaching device with the stories developed by Stone (119) and concluded that sociodrama offers promise as a means of translating ideals into overt behavior.

Meier (77) described the case history of a work group of teachers who developed a framework for teaching democracy (22). He concluded that teachers must have skill in democratic, cooperative group procedures if they are to teach and demonstrate these skills and values to students. Stull (122) developed six scales which teachers employed to study the relation between the ability to put one's self into the social position of another and six aspects of democratic behavior.

Democratic Classroom Procedures

Dalton (28) surveyed sixty-five fifth- and sixth-grade classes to determine the extent of democratic practices and concluded that there was a greater emphasis on "talk" democracy than on "do" democracy. There was only a slight relationship between what a teacher said she believed and what she actually did in terms of democratic classroom practices. Johnston (51) studied forty-three democratic teachers and forty-two autocratic teachers based on administrative ratings of more than 300 teachers. The democratic teachers tended to be more confident in themselves, more self-sufficient, more liberal in social attitudes. The very experienced and the very inexperienced tended to be more autocratic.

Johnson (50) made stenographic records of fifty-five planning lessons in seven elementary schools and concluded that social studies was the field which most frequently furnished the problems for the planning periods. Howe (47) described the development of teacher-pupil planning in Glen-coe, Illinois, and concluded that while the whole faculty became more aware of teacher-pupil planning, more attention should have been given to the process and less to the recording of plans. Wesley (127) developed a questionnaire to determine the extent of pupil participation in activities directed toward the improvement of practices in food, clothing, and shelter. Rehage (102) compared pupil-teacher planning and teacher-directed procedures. He found that teacher-pupil planning did not result in less learning of subjectmatter and did make students more discriminating in their use of reasons to support solutions. DeLong (30) studied the effectiveness of a logical approach and a psychological approach in the teaching of social science at the college level. The psychological approach was clearly superior.

Group Discussion

Rickard (103) studied the effectiveness of group discussion in the teaching of factual content and noted a material and statistically significant gain in factual content knowledge. McNassor (76) employed free group discussion with emotionally upset soldiers and concluded that the group process warranted wider experimentation both with emotionally disturbed young people and in connection with readjusting the sentiments of normal people. Strang (89) concluded that where leaders understand and apply group work methods, the members are usually friendly, cooperative, and purposeful. They take initiative and continue their work without adult supervision. Litchen (68) suggested patterns, common pitfalls, and helpful technics in group discussion.

Reading and Comprehension

Rudolph (108) found significant gains in knowledge, skills, and attitudes when reading instruction was incorporated into the content of social

studies courses. Aukerman (6) found a good general reading ability and the ability to pick out main ideas in paragraphs to be the types of reading most closely associated with eleventh-grade American history achievement.

Dunfee (34) found that the reading of specially selected source materials was difficult but made a contribution to the elementary social studies program. McLaughlin (75) measured the effects of three types of text materials on sixth-grade children and concluded that in the absence of collateral readings, it is better to read a single expanded version than to read a single textbook treatment or to use two textbooks.

Tiedeman (124) found that retention of material was significantly benefited by review tests. Bates (9) found that children's understanding of social studies concepts was closely related to general verbal ability, but that there appeared to be a special social studies vocabulary ability.

Audio-Visual Aids

Dale, Finn, and Hoban (88) reviewed the research on audio-visual materials. Parks (95) found the most common perceptual experiences provided were blackboard and map. VanderMeer (125) concluded that practically the same results could be obtained by use of four pages of mimeographed materials as were obtained by the use of "The Birth of Our Freedom" filmstrip. McCarthy (71) found that the use of coordinated filmstrips with sound films enabled pupils to achieve higher scores on elementary geography tests. Cook (25) found that currently available classroom films when used in addition to the teacher's motivation did not motivate the pupils to greater educational activity than did the teacher's usual oral methods.

Learning Situation

The Detroit Citizenship Education Study emphasized the relationship between mental health factors and the quality of citizenship (32). Withall (133), in the belief that learning is most likely to occur in a nonthreatening situation, developed a technic for assessing the social-emotional climate in a classroom by categorizing statements of teachers. Elias (38), in a study of 4500 seniors from rural and urban high schools, found a higher proportion of social isolates in the larger town high school than in either the rural or metropolitan high school. Blair (11) concluded that schools striving for a better understanding of the older child will place less emphasis upon adult standards and more upon the leads which the child gives. Austin and Thompson (7) found that personality characteristics appeared to be the most important factors influencing children's selection and rejection of friends. Bradfield (14) found that youth's understanding of what effects their behavior is superficial and relates to that which is easy to understand.

Moser and Muirhead (84, 85) in a study of military enlisted men found that the historical-factual material upon which the *Cooperative American*

History Test was largely based was rapidly forgotten after the individual was removed from the school's environment. Snider (116) found little relationship between units of social science work earned and achievement of social science students based on freshmen preguidance examinations. Flickinger and Rehage (41) summarized the recent research on time and place concepts. Collings (24) found that urban students live in relatively isolated neighborhoods and have missed contact with many important community institutions and agencies. Merrell (81) found that students with extensive travel experience did higher quality work in college geography than did the students with limited travel experience.

Evaluating Citizenship Practices

A survey of citizenship practices in Michigan high schools was made by Herrick (42), who concluded that there were four major patterns for citizenship training: (a) student government, (b) instructional technic, (c) student participation in community projects, and (d) citizenship evaluation technics. Pfleiger (97) described the efforts of one high school to improve its citizenship education program and concluded that a consultative-cooperative method was effective in producing curriculum changes which helped in the development of improved citizenship. Weston, Pfleiger, and Peters (129) developed a pattern for evaluating the citizenship values of any school activity.

Meier, Cleary, and Davis (78) developed a framework for evaluating a student council. Shipp (114) studied ways of improving the student council at the secondary-school level and O'Toole (94) studied the elementary-school student council. Both indicated a need for broader representation and for a better definition of activities. MacGuffie and Umstattd (74) surveyed the student council in the secondary schools of Texas.

Langston (63) studied the ideals of adult organizations and found a group of common ideals, loyalties, and purposes expressed thru these organizations but warned that complete emphasis on one or a few ideals of American life at the expense of others may well be a threat to the security of our heritage. Lowe (70) studied the pattern of totalitarianism in rejecting totalitarianism it was not necessary to reject all the small technics and concepts which were employed in their citizenship programs.

Tests

Stutz (123) developed a multiple-choice test on the United Nations. Raths (101) developed a test of emotional needs called *Self Portrait N.* Edwards (37) described an attempt to construct a new test of critical thinking. Altho science is the subjectmatter of the test, the technics are applicable to the social studies.

Attitudes

Shimberg (113) studied the relation between information and attitudes by an opinion-poll technic, concluding that information was a potent factor in shaping the attitudes of young people. Klee (59), in a classroom experiment, concluded that class discussion was the most important single factor in determining changes in attitude toward war and peace. Robbins (104) studied the ability to be objective and accurate in the selection of reasons for a person's choice of opinions and found a tendency to agree with statements reinforcing one's opinion and to disagree with those favoring an opposed opinion.

Selecting Outstanding Citizens

Hollister (46) studied the characteristics of New York State high-school seniors who had been selected by their fellow students and found that they were outstanding in social adjustment, morale, intelligence, grades, and school and community activities. In contrast, Delp (31) found that selection of outstanding young citizens in Nebraska, by a series of tests, resulted in the selection of many outstanding citizens, but it also allowed participation by many who were not outstanding and by some who were even poor citizens. Similarly, Bath (10) concluded that persons who were awarded efficiency certificates at the junior-high-school level were not particularly more outstanding than were others who had not been awarded certificates. Keller (53) found superior socio-economic status, high intellectual ability, and scholastic success to be important factors influencing choice for leadership positions.

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CHAPTER II

Intercultural Education

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THE past three years have noted the publication of a number of significant research studies in intergroup education. Of particular importance have been those studies which have been directed toward gaining a better understanding of the nature and roots of prejudice.

The Development of Intercultural Education

Many intercultural education leaders have long recognized the necessity of developing a theoretical, conceptual framework regarding the nature of prejudice in order that efforts to improve intergroup relations might be firmly built. Yet it is only recently that the scientific groundwork has been laid by the psychological and social sciences. Handicapped by insufficient research on the understanding of prejudice, intercultural education in its earliest years struggled thru the missionary and over-simplified-answer stages. In the early nineteen forties, intercultural education began to come of age with the initiation or expansion of activities by the Bureau for Intercultural Education, Intergroup Education in Cooperating Schools, College Study in Intergroup Relations, Anti-Defamation League, American Jewish Committee, National Conference of Christians and Jews, and Commission on Community Interrelations. Characteristic were pragmatic explorations into the technics and practices which seemed most promising in effecting attitudinal changes. Increasingly apparent today is an emphasis upon careful and deliberate research into the causes of prejudice and the most effective ways of combating it.

The Nature of Prejudice

The weight of the research evidence surveyed seems to support the findings of Ackerman and Jahoda (2), which indicate that there are two major sources of prejudice and discrimination toward minority groups: (a) frustration and (b) cultural learning.

* The authors wish to acknowledge the financial grant of the Anti-Defamation League of B'nai B'rith to the University of Illinois for this project. The assistance made possible a trip for a week of interviews with national leaders in intercultural education. Research appraisal technics and important trends in intergroup education were discussed. Interviewed were: Hermann H. Giles, Center for Human Relations Studies, New York University; Otto Klineberg, Columbia University; Louis Raths, Bureau for Intercultural Education; Arnold Rose, University of Minnesota; Frank Trager, Leo Strole, and the Research Staff, Anti-Defamation League; Robin Williams, Cornell University; Louis Wirth and the Research Staff, Committee on Education, Training, and Research in Race Relations of the University of Chicago; and Rudolph Wittenberg, Research Department, American Jewish Committee. The help of these men and groups is gratefully acknowledged. Responsibility for the findings of this review is, of course, that of the authors alone.

An increasing body of data, such as that reported by the above authors in a later study (1) and by Miller and Bugelski (58), lends support to the position that the tensions and insecurities resulting from frustration are translated into expressions and acts of hostility and aggression toward minority or out-groups. The sources of these frustrations are to be found both in the personal-family environment (36), which operates most strongly upon the individual during his early preschool and school years, and, increasingly, in the larger social structure as he matures (86).

Ackerman and Jahoda (1) found that out of the forty cases of anti-Semitism collected for their study there was not a single example of permanently well-adjusted marital relationship between the parents of the anti-Semites, a condition almost certain to result in many tensions. However, as Hymes (42) pointed out, tensions and insecurities experienced in family and early peer group relations do not necessarily determine a person's prejudices. Tensions and insecurities may simply predispose him to seeking an outlet for such feelings.

The work of Komarovsky and Sargent (43) described some of the influences of subcultures upon personality. This study supported the generalization that the designation of specific groups toward which hostility shall be directed depends largely on the societal pressures that operate upon individuals. The importance of the class status system, both as a source of tension and as an agency for focusing existing hostilities upon certain groups, was indicated by Davis (21) and by Bettelheim and Janowitz (8). The latter authors, upon the basis of intensive interviews with 150 war veterans, disclosed a marked correlation between anti-Semitism and social mobility, particularly downward mobility. Hatt (34) also dealt with the relation between social class and ethnic attitudes, while Centers (11) discussed attitudes in relation to occupational stratification. However, while emphasizing with Davis the intimate relationship between these societal influences and the individual's total personality, Bettelheim and Janowitz concluded that intolerance is less a function of the objective social situation than of one's personal evaluation of that situation.

A number of writers (33, 54, 60) indicated that another source of prejudice can be discerned. This second source of prejudice, cultural learning, is not explainable in terms of frustration. As MacIver (54) suggested, prejudice can also be explained thru the processes of indoctrination and habituation. Data from the Philadelphia Early Childhood Project (66, 89), on which a full report is now in preparation, indicated that prejudices develop out of adult values and the status quo to which children are exposed, as well as out of situations generating insecurities and frustrations. Radke, H. Trager, and Davis (66) observed that many children have opportunities only for the kind of learning about groups that involve stereotypes and rejection. Children often rejected groups not present in their environment. Lewin (49, 50) indicated that a way by which groups and institutions perpetuate themselves is thru the exercise of strong pressures upon their members to conform to the group norms.

As a consequence of such pressures, individuals find themselves dependent upon the group for the determination of what is real and what is right.

Two insights into the nature of prejudice, which at first seem paradoxical, are of considerable value to the student of intergroup education. The first is the existence of authoritarian personalities which, according to Adorno and his associates (3), contain a broad and coherent pattern characterized by conventionality, rigidity (70), repressive denial, fear, and dependency. The second is the high degree of inconsistency characteristic of the reactions of individuals toward members of other groups. Such inconsistency may take the form of responding favorably to a given group in one situation and unfavorably in another, or of accepting one kind of relationship with such a group while rejecting an apparently much less personal type of contact (45). Deutsch and Collins (22) reported that such inconsistencies were apparent in members of public housing projects interviewed, as did the contributors to an issue of the *Journal of Social Issues* devoted to the problems of inconsistency (14).

These two types of evidence, seemingly contradictory, were reconciled ably by Ackerman and Jahoda (1) who related them to the ego-integrative forces stemming from the person constantly seeking to associate and order his experiences into a coherent and consistent whole, and to the divisive forces of a complex society in which the requirements for status in one aspect of life are antithetical to those of others. The interrelationship between such factors was also recognized by Bettelheim and Janowitz (8, 9). They pointed out that personality structure alone cannot entirely explain why people set out to discriminate against particular ethnic groups or why they are more prejudiced toward one group than another. The defensive needs of the individual, the economic and social structure of the community, and the ethnic realities of the moment must all be taken into account. As Deutsch (14) concluded, "efforts to produce change in the individual must not only be directed at the individual but also at the social institutions and group standards which determine the individual's values and which help to induce the goals for which he strives."

It is in such a complex context that the problem of improving intercultural relations must be considered. The task is formidable and multifaceted. Obviously, a high degree of cooperation is essential between human relations agencies and the psychological and social sciences. Such cooperation is increasingly apparent in the work of such groups as the New York University Center for Human Relations Studies, the University of Chicago Center for the Study of Intergroup Relations, and in the movement fostered by Clinchy (16) to increase the number and scope of activities of such centers. The need for cooperation has been increasingly recognized in the number of research projects calling upon the skills of men trained in a variety of disciplines, as pointed out by Max Horkheimer and Samuel Flowerman, editors of the Harper's Studies in Prejudice Series (3). Further encouragement may be found in the coordination of the research efforts of many institutions around one basic problem, as in

the case of the College Study in Intergroup Relations (17, 18) and the increased emphasis upon action-research by such groups as the Commission on Community Interrelations of the American Jewish Congress (13, 14, 76).

What Schools Can Do

Five major approaches to developing democratic human relations have especially been studied in current research. Many of these approaches had been suggested as promising practices by educators who based them primarily on teaching experience, educational theory, and the limited research available (41, 91, 92). It should be noted that a large number of the current research studies considered demonstrated an awareness of the necessity for developing programs which included a wide variety of approaches, even as they chose to limit their investigation to one.

1. The creation of a democratic atmosphere designed to reduce the personal insecurities and tensions of children.

Ackerman and Jahoda (1, 2) found that emotional predispositions to anti-Semitism include anxiety, confusion of the concept of self, unsatisfactory interpersonal relationships, conformity, fear of the different, poor perception of reality, an inconsistent value system, and a poorly developed conscience. Much research points to the importance of wholesome family relationships prior to and concurrent with the school experiences of children for minimizing such difficulties. There is also good reason to believe, with Kilpatrick (41), Weston (93), Taba (83), and others, that a warm, friendly, democratic atmosphere in schools may help to strengthen the healthy attitudes already present in many young people, and to some degree at least, make up for the shortcomings in home environment experienced by others. Kilpatrick and Van Til (42) indicated that perhaps the single most important factor in building good human relations thru the school is a democratic atmosphere, and defined such an atmosphere as one which involves acceptance, belongingness, and welcome as a person.

The importance of the classroom teacher in effecting attitude changes, and the influence which teacher attitudes have upon those of the students have been pointed out by Russell and Robertson (75), Radke, H. Trager, and Davis (66), and others. Those institutions involved in the College Study in Intergroup Relations (18, 32) recognized the crucial role of the teacher and instituted surveys and reexaminations of their teacher preparation programs.

Analyses done in the area of group dynamics (51, 62, 84) lead us to believe that a reexamination of the ways in which school groups are organized and conducted will point out possibilities for materially reducing individual tensions and insecurities. Tolman (87), in describing social

learning, commented briefly on some of the possible ways of translating or dissipating aggressions against out-groups.

2. The encouragement of broadening intergroup contacts in situations involving cooperation.

The findings reported by Stouffer and others (81), drawn from data obtained by the Research Branch of the War Department, and those reported by Whittemore (94) with regard to the experiences in the "G. I. Universities" following the war, lend strong support to the *fait accompli* as a method of intergroup education. Data from the former group, in answer to a question relating to attitudes toward serving in a company containing Negro and white platoons, disclosed that of the men not having had such experience, only 2 percent stated they would like it. Sixty-two percent indicated they would dislike it very much. A literal revolution in attitudes was apparent from the responses of men having had such experience. Thirty-two percent stated they would like it and only 7 percent indicated they would dislike it very much. As Stouffer and his associates pointed out, this technic is particularly promising when "attention is focused on concrete tasks or goals requiring common effort rather than upon more abstract considerations of justice or of desirable policy which emphasize and arouse traditional prejudices." A similar conclusion was reported by Wittenberg (98) with respect to neighborhood projects.

The value of contacts in situations involving cooperation was reported by Deutsch and Collins (22) with respect to intergroup contacts in public housing projects. Findings by Phelps (64, 65) in school work camps also seem to corroborate the value of this technic. Particularly promising results are yielded by situations in which the pressures to conform to prior arrangements are lessened. The conditions of contact are important, according to B. MacKenzie (55) and as research on social distance prior to the current period of investigation has repeatedly demonstrated. One of the conclusions of the Philadelphia Early Childhood Project (66) pointed out that such contacts needed to be accompanied by other change technics to prevent some prejudiced persons from regarding the contact merely as an exception to their previously formulated generalizations.

3. The provision of opportunities for enhanced emotional sensitization to other intercultural groups.

The role of emotions in the educative process has long been underestimated in American educational thinking. The work of Prescott and his associates has been a valuable stimulus toward recognizing the emotional as well as the intellectual facets of the learning process. In human relations research the importance of building into personal frames of reference an emotional sensitivity to other persons and groups is now receiving increasing attention. Davidoff (20) found a positive correlation between empathy and attitude toward minority groups. Kramer (45), in discussing dimensions of prejudice, called attention to the emotional as well as the

cognitive and action facets of such attitudes. Woodruff and DiVesta (99) observed that an important way of changing attitudes is to change the individual's concept of the object toward which the attitude is expressed, a process which must necessarily include emotional considerations.

A significant part of the work of the staff of Intergroup Education in Cooperating Schools (85) has been devoted to developing school curriculums which emphasize human relations problems thru the medium of literature, particularly novels. Reports suggesting the potentialities of literature for both the elementary and secondary levels were made by Franc (28), Finley (25), and Rollins (71). H. Trager and Everitt (88), speaking from experiences with primary grade children in the Philadelphia public schools, doubted that books alone are sufficient, but suggested that their value lay in reinforcing, interpreting, and extending the experience of children.

Analyses of the effectiveness of movies as a media for attitude change have been made by Raths and F. Trager (68) and by Sherif and Sargent (78). The latter authors noted that the high degree of ego involvement present in movie audiences was an important factor in the adoption of new form and values or the maintenance of old.

4. The promotion of situations in which individuals may be exposed to the inconsistency or invalidity of some of their existing attitudes.

It is notable that in contrast to the preceding half-decade, when a large number of research studies were concerned with the effectiveness of information presented in curriculum courses as a means of changing intergroup attitudes, practically no such projects were reported in the period from 1947 to 1950. Bierstedt (54), in summarizing much of this earlier research, concluded that appropriate instruction under certain conditions does have an influence on attitudes toward out-groups, but pointed to the necessity for research as to the kind of instruction and conditions which accompany it, as well as into the character of the students involved. Similar tentativeness is apparent in Rose's generalizations on the effectiveness of information (73), also based on a summary of research.

Current researches have placed considerable emphasis upon study of persons exposed to data that contradicts their presently held attitudes. Lippitt (51), Kretch and Crutchfield (46), and others have observed that the effectiveness of facts in bringing about attitudinal changes is frequently dependent upon the extent to which those attitudes we seek to change are themselves involved in obtaining the facts. Much of the work of the Commission on Community Interrelations (13, 14, 76) has been devoted to an analysis of the role of action research in intergroup education. Chein (12), reporting upon the Montclair, Minneapolis, and North-town community self-surveys, noted in a composite summary such concrete changes as the passage of an FEPC ordinance, the admittance of Negroes into an important local union, the construction by private builders of a 350 dwelling unit for Negro occupancy, and the first employ-

ment of Negroes as teachers, school principals, policemen, and sales-clerks.

5. Strengthening the "social supports" of democratic behavior.

In contrast to the oft-repeated phrase, "you can't legislate good human relations," evidence from studies made in conjunction with the work of the New York State Commission Against Discrimination (4, 79) indicated that patterns of behavior in employment practices could be substantially altered in a short period of time. Watson (92), in summarizing research dealing with the effects of legislation, arrived at a similar conclusion. Cook (17) pointed out that discrimination teaches prejudice rather than prejudice fostering discrimination. Montagu (59) noted that unless educational programs are accompanied by social and economic arrangements which support the more desirable attitudes, all the institutional pressures upon the individual will be in the direction of a resumption of his original attitudes.

Perhaps one of the most thorogoing programs for intergroup change thru legislation was that presented by the President's Committee on Civil Rights in an influential and outstanding report (90). Much of the recent work of the Anti-Defamation League has been devoted to the implementation of this program thru mass media and conferences as well as thru educational materials. The Anti-Defamation League also publishes the Freedom Pamphlet Series, an important contribution to disseminating intercultural insights, which includes syntheses by Allport (5), Kilpatrick (41), Sparling (80), and many others.

Another approach, the dissemination of propaganda thru the mass media (26, 27, 74), tho closely associated with emotional sensitization and with the imparting of information, may well be discussed under social supports. For, as Lazarsfeld (48) pointed out, the major value of mass propaganda lies in its introduction of an alternative mode of behavior to persons whose environment might otherwise have taught only prejudice and discrimination. Helson (35) and Kretch and Crutchfield (46) referred to a theory of adaptation level which holds that the introduction of extreme statements regarding a social issue will change the acceptance level of the individual exposed in the same direction in which the range of alternatives in the perceptive continuum has moved.

The use of propaganda is subject to serious limitations because of the likelihood of its reaching mainly those who are least in need of such ideas and because most prejudiced persons may avoid exposure by withdrawal (19, 27, 47). Advocates of propaganda as an approach urge, however, that its use constantly reinforces those who already hold democratic attitudes. Williams (95), summarizing research studies on the use of propaganda, generalized that its effectiveness tends to be greater when the material is linked with prestige symbols.

Lazarsfeld's observation that personal persuasion is more effective than large-scale programs because of its flexibility and adaptability to the

individual or group in question suggests that propaganda might be even more effective when adapted to individual community, school, and classroom groups. But whether the school should be used as an agency for propaganda, however beneficent or democratic, will long be a topic for educational controversy.

Trends in Research Methods

Research in intergroup education has increasingly moved away from the measurement of student reactions in college classrooms and into clinical laboratory studies and larger social field investigations. Both depth and breadth dimensions of the problem field have been expanded. The first three volumes of the Harper Studies in Prejudice Series (1, 3, 8), sponsored by the American Jewish Committee, illustrated methods entailing a deep probing into the personality patterns of individuals. The latter two volumes (53, 57), along with the work of the Commission on Community Interrelations, the Anti-Defamation League, the Social Science Research Council, and others, suggested a more extensive examination of attitude change in the broad context of the community with its complexity of cultural influences.

Attention is called here to the methods and technics developed or extensively employed in the research studies examined. Methods increasingly used were intensive interviews by trained persons (1, 2, 3, 8, 31), *Rorschach* and *Thematic Apperception* tests (3, 8, 69), group therapy (7, 44), sociometrics (6, 38), surveys based upon responses of groups in concrete life situations (housing projects, armed forces, etc.), nonverbal tests (66, 89), and community self-surveys. Attitude scales were subjected to continued research and refinement (23, 24). Of particular concern to students of attitudes were unidimensionality of attitude scales (45) and the indication of the intensity with which a given attitude is held (37, 82).

Summary and Needed Research

The past three years appear to have been important ones for intergroup education, marking the continuance of the "coming of age" of the movement. Especially significant has been the development of a concept of the nature of prejudice substantiated by research. The emerging framework aids in integrating the efforts of those persons and groups seeking to accomplish similar ends. Important, too, are studies validating or modifying proposed approaches to intercultural education.

Much remains to be done, as Williams (95), Cliney (16), MacIver (54), Chein (12), Wirth (97), and others have indicated in discussing promising areas for further research. Nevertheless, there would seem to be good cause for encouragement to be found in the progress of research since the war. Systematic summaries of research findings by Rose (73), Williams (95), Watson (92), Bierstedt (54), and Shapiro (77), a study

of the handling of minority groups in three-hundred textbooks (96), and the birth of a bulletin (15) devoted wholly to a quarterly summary of research underway in intergroup relations, suggest a "stock-taking" which is an important characteristic of maturity.

It is also encouraging to note in intercultural education a heightened appreciation of interrelationships and interaction. For instance, there is a growing emphasis upon the school *in society*, both as it influences and is influenced by other social institutions and forces. There is growing recognition of the relationship between process and product, and consequent deep concern with both. The ties between emotion and intellect are emphasized. Increased cooperation is evident between psychological and social disciplines, between research workers and action agencies, and between home and school. Most of all, it is heartening to find that these emphases arising out of research concerned with improving intergroup relations closely parallel and undergird our emerging concept of what constitutes good democratic experimental education for American schools.

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CHAPTER III

Education for Work

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MUCH of the literature published on work-experience programs prior to March 1947 was centered on descriptions of work-experience programs and their educational value. Wert and Neidt reported in the REVIEW for June 1947 on studies which indicated how the impact of World War II brought a revival of emphasis of work experience as an integral part of the school program.

Education for work must be geared to the contemporary scene. Changes in the school population during the past three years, caused by lack of full-time job opportunities for youth under eighteen, forced a consideration of the problem of educating larger numbers of youth who were not interested in continuing their schooling unless educational offerings became more meaningful. Subsequently, more recent studies and reports related to work-experience programs have tended toward evaluation and appraisal of their effectiveness for assisting individuals in their preparation for work and self-adjustment. While several references were of the how-to-organize and descriptive type, most were concerned with critical issues involved, opinions for participants on values to themselves, studies of characteristics of the good and poor worker, and trends for further expansion and problems related thereto. One noticeable trend was the new types of work programs evaluated such as those in corrective institutions, summer camps, and community colleges.

Work Programs In Corrective Institutions

In 1947, McGrew (25) sent an inquiry to thirty-seven representative institutions which had production-type work-experience training programs for youth, fourteen to twenty years of age, to discover the extent to which this training was purposive. Thirty-one institutions replied and they agreed almost uniformly that desirable values were obtained under proper safeguards and guidance. Limiting factors were length of stay and lack of follow-up to determine the usefulness to the trainee after he leaves the school.

Camp Work Programs

The educational values of voluntary work camps are exemplified in a number of studies. Phelps (29) reported on the reactions of twenty-five high-school youth who worked at two camps co-sponsored by the Laboratory School of the University of Chicago and the American Friends Service Committee. Their expressions displayed heightened insight into the social

and economic problems of the communities and wholesome attitudes toward hard work, in addition to learning the art of group living. Henderson (16) pointed out that 95 percent of the students said the hard, physical work was most beneficial, 60 percent said that democratic group living was helpful, and 90 percent claimed that their whole outlook of life had broadened. Wood (39) reported in detail the true-to-life narrative of eleven persons who worked in volunteer projects. Youth work-service projects for the summer of 1950 have been compiled for thirty-three youth service organizations (9). This list, revised each year, describes each project, who is eligible, costs or income, how and where to apply.

The school camps, supported and operated by the schools, are a relatively recent development (24, 34). These may be used to supplement the over-all curriculum in the area of work experience (2). Houldlette (18) and Hosking (17) described the what, where, who, and why of camps for children. Values for both children and teachers were enumerated.

College Level Programs

Park (28) reviewed the basic philosophy and early beginnings of the cooperative approach as conceived and promoted by Herman Schneider as early as the year 1906. Alexander (1) described the basic purpose of the work-study plan at Antioch College. Brief reports from student participants were quoted. Brooking (6) related the manner in which subjects taught in the classroom were integrated into the well-rounded training of the mechanic, technician, or engineer. The work-study program in a community college was reported by Wood (40). Follow-up studies showed that employed students had greater classroom achievement than their counterparts who were not employed. Conversely, students with regular part-time jobs were better employees than were workers who had abandoned the idea of further education. Truelove (37) described the reactions of college students in a work-experience program in a laboratory school bookstore.

Organization of High-School Work Programs

Reports such as those made by Bradley (5), James (21), Strobeck (36), Forkner (12), Beckley (4), Dresden (11), Egging (26), Gilchrist and Gillies (15), Christensen (8), Gainor (26), and Ivins and Wey (20), and the University of the State of New York (27) described how work-experience programs function; how certain teachers or school administrators initiated a program; what objectives were established; and what steps are necessary for students and teachers to get the most out of a program.

Schmaelzle (33), in addition to describing operational procedures, included an opinion poll of 535 persons actually working on the program.

Such positive contributions were expressed as "increasing a student's sense of responsibility and self-reliance, realizing economic self-sufficiency, a means for finding a desirable vocational field, and experiencing a sense of achievement." Riedinger (31) offered many practical suggestions by which teachers and counselors can help students to get the most benefit from their work experience. Wadsworth (38) reported on how the local school and the local public employment service can cooperate in a work-experience program thru counseling, testing, explaining labor market conditions, making monthly reports to school officials on the pupil's progress on the job, and the like. The procedure described is unique and suggests ways for schools to utilize community services.

Evaluating Outcomes and Worker Characteristics

Landy (22) suggested six qualities which schools should help pupils to acquire thru real work experiences. Bateman (3) attempted to ascertain the extent to which working and nonworking high-school students were selecting vocations which agreed with their interests and to determine the extent to which working and nonworking students agreed as to interests as measured by the *Kuder Preference Record*. The study indicated that students who do not work tend to select occupations which are more consistent with their measured interests than do students who are working. Working and nonworking students do not differ greatly in their interest patterns as measured by the *Kuder Preference Record*.

Dillon (10) stated that in one city as high as 60 percent of students indicated they would leave school if taken off the work program. Regularity of attendance improved for those students enrolled in the program. Incidents of being sent to the principal's office for discipline were practically nonexistent. Nearly 87 percent of the students included in the study indicated that work experience had impressed upon them a realization of the need for further education.

A survey was made in 1947 by the American Association of School Administrators (2) to discover the extent to which work-experience programs were utilized in the learning process. The study concluded that for desirable outcomes, the task must be socially useful, must give the pupil useful insights, attitudes, habits, and skills as a working member of society. Among the high schools reporting, 54 percent indicated they were offering some type of work-experience programs.

Under the supervision of Sower (35), a study was made on work interests and attitudes of 6589 tenth- and twelfth-grade students from sixty-five public and private high schools. The findings indicated that most students had had experience which gave them definite notions of the occupational work they wanted and expected to enter. Students stated that occupational aspirations which they expected to attain would require hard work and individual achievement. They desired a work situation which would offer personal recognition in a congenial group. A wide discrepan-

ancy was found between the vocational plans of many students and the actual opportunities in the labor market.

Legg, Jessen, and Proffitt (23) made a study of work-experience programs in 136 school systems in order to canvass the experiences in different regions and to study the schools' participation in the control of school-and-work activities so that they might make known both the advantages and disadvantages of school-and-work arrangements, other than arrangements under established cooperative programs. A valuable summary was made of specific good and bad features of school and work programs. Phelps (29), Henderson (16), Wood (39), and Wood (40) also included reports on outcomes.

Friend (13), and Friend and Haggard (14) attempted to find a means of separating the people with good potentialities for adjusting at work from those with poor ones. A checklist of 173 characteristic items which were thought to have a relation to work adjustment were developed. It was found that those characteristics related to early family life, mature or current family life, early or beginning jobs, personality patterns and general work reactions, and reactions to specific conditions of work, as well as those related to general work capacities, adjustment, and improvement, could well be used to evaluate worker progress in work-experience programs. The findings showed that people take their early family experiences and attitudes with them to their jobs and react to their work accordingly.

Present Status

Ivins (19) made a careful survey to discover both the status of work programs a year and a half after the close of the World War II and the expected trends. Replies were received from all states. A total of 1859 schools were reported as having some type of work-experience programs in 1947 as compared with 166 in 1935. Camp programs were being conducted by 279 schools. Fourteen states indicated that expansion of programs was being delayed by lack of funds and competent personnel. There was a lack of agreement between states on a standard terminology for educational work programs.

Riedinger (30) attempted to find out whether in a large industrial city in 1948 as many students were employed part-time after World War II as before. Studies indicated the same percentage of boys were employed. There was a noticeable decrease in the number of employed girls.

Meeting Future Needs

Perhaps the most significant steps to meet future work-experience and employment needs for workers of all ages were reported in a recent conference on employment (7). Anticipating probable shortages of work opportunities at all age levels, the governor of California called a conference to study how to whip the problem before it became critical. One

section of the conference concentrated on the employment needs of youth both in and out of school. Among the specific recommendations related to work experience for youth were the following: (a) work-experience programs involving part-time work and part-time school should be expanded, (b) there is need for expanding guidance and placement services for both in- and out-of-school youth, and (c) a coordinated and continuous research program should be undertaken to discover job opportunities, to reveal unserved areas of economic need, and to make full information available to schools and employment agencies and to youth themselves.

Critical Research Issues

Some issues which Sampson and Jacobson (32) indicated need further clarification are: (a) What is the proper amount of credit to be allowed toward graduation? (b) What proportion of the student's time should be spent in school and on the job? (c) Are the labor unions adequately represented in planning and operating a program? (d) When should a student be allowed to start a work-experience program? and (e) What factors must be considered before determining readiness for a work program?

Similar issues for further research are indicated by Friend (13), Friend and Haggard (14), Legg, Jessen, and Proffitt (23), Dillon (10), Ivins (19), Gainor (26), Riedinger (31), Henderson (16), and the California Governor's Conference on Employment (7).

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CHAPTER IV

Education for Leisure

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THE period from March 31, 1947, thru March 31, 1950, was quite characteristic of earlier periods in that research in education for leisure was not undertaken except by a few writers and scholars. Lack of research in recreation, to which education for leisure is directly related, is an easily recognizable and a readily admitted deficiency among recreation professionals. Much of this shortcoming is traceable to absence of encouragement of research scholars in our some thirty-five colleges and universities which offer major curriculums in recreation leadership.

Studies described here are therefore limited in number. Most of them apply directly to education for leisure, while a few are included which apply only indirectly. Inclusion of the latter is justified on the basis that they are concerned with research in recreation personnel, which is a factor of primacy in education for leisure, and with research studies of a statewide nature, which reveal several deficiencies, some of which can be partly alleviated thru good programs of education for leisure.

Elementary School

One study (16), designed to compare the values of education thru camping with the benefits of the usual school-in-schoolhouse program, resulted in some favorable findings for the outdoor-education movement. Involved were thirty-two fifth-grade children and thirty seventh-grade children in New York, New York, who attended camp for a period of three weeks. In comparing their achievements with two control groups participating in the traditional classroom program it was found that the campers tended to show superior gains in academic test results and a superior growth in intercultural understandings.

Bloomberg (4) conducted a limited experiment in play therapy involving two groups of five normal children each, most of whom had problems of sibling rivalry. He found that thru group association children come to realize that they are not alone in their difficulties and that it is important to discover adult leaders who can accept hostile feelings of children and attempt to modify them.

Secondary School

Olds (17) directed a preference study in which, in order to gain better over-all cooperation, the high-school students involved were given an opportunity to plan the study. After activity preference lists were estab-

lished thru the questionnaire method, it was observed that boys tend to prefer spectator sports more than girls. On the other hand, the girls engaged more in reading, attending motion pictures, concerts, and dramatic plays than did the boys. It was also found that girls showed a great deal of interest in organized leisure activities outside of school and that for both boys and girls playing games was almost as frequently engaged in as going to the movies.

Nelson (15) developed a study based on the hypothesis that high-school boys who elect to substitute military training for the physical education requirement differ somewhat in their leisure time pursuits from the rest of the boy high-school population. Nelson concluded the military training may serve as a means of achieving vicarious success of a sort; that students who select the military program apparently dislike physical activity, competition, and social activities; and that the boy who is frustrated in finding satisfaction in highly competitive physical activities may psychologically achieve some satisfactions thru membership in a uniformed group.

Smith (20) concluded that participation in extracurriculum activities promotes social adjustment and that nonparticipation leads to social maladjustment and that, therefore, such activities should be incorporated more directly into the curriculum rather than be treated as peripheral activities. As a result of her study of 1751 high-school students, Smith concluded that the purpose of extracurriculum activities is to develop increased social and personal adjustment and develop leisure interests and skills thru informal group participation.

The relationship of muscular strength to leisure-time physical-activity preferences of adolescent boys was reported by Van Dalen (21). He found that boys of low index of muscular strength tend to participate in individualistic games involving a minimum of organization whereas boys of high strength index participate in games requiring greater muscular coordination. Van Dalen concluded both that where muscular strength is deficient the boy is seriously handicapped in his ability to play and that because personality and social adjustment are partially effected thru play, the school should give attention to developing muscular strength in boys.

The importance of reading as a leisure interest has long been recognized. Most libraries have recreational reading as their basic function. McCarty (11), in a study of fifteen school libraries in Florida, found that of the total reading done by boys and girls in Grades VII thru XII, general fiction was the most popular type. It accounted for over 40 percent of all reading. McCarty concluded that because of the importance of reading as a recreational activity the principal objective in the teaching of literature should be to guide children to a better selection of reading materials.

College and University

A study by Mason (12) substantiated earlier studies by others which found that college students tend to value most those physical activities which can be carried on with facility in community life. Sports such as swimming, golf, and tennis were rated high whereas calisthenics, wrestling, and heavy apparatus activities were consistently disliked by the 1140 college men who participated in the study.

A similar study carried out by Adams (1) stressed the importance of offering games and sports in college that can be carried on later in a community setting. In order to accomplish this, it was pointed out, facilities and equipment provided by colleges must be broad in scope.

The opinions of college students regarding their recreation interests and opportunities was the subject of another study on a broader base (14). The 1000 students interviewed at the University of Minnesota in this study were selected to represent proper proportions of each college, class, sex, veteran groups, nonveteran groups, married students, and single students. Very little difference was found in the opinions of the various subgroups. One recommendation developed partially as a result of the study was to employ a campus recreation coordinator.

Williamson (23), in investigating the group origins of student leaders, found that whereas nonfraternity students made up 73 percent of the enrolment at the University of Minnesota, they held only 36 percent of the student leadership positions and that the extent of concentration of fraternal groups in leadership positions was increasing and of non-fraternal groups decreasing. He concluded that extracurriculum education may be of value in developing leadership.

Family Recreation

At least one study (7) related to the effect of television upon leisure time activities. It was found that families that possessed television sets tended to decrease their out-of-home recreation pursuits, particularly attendance at motion picture theatres. They also reduced the amount of time previously devoted to reading. Insufficient evidence was available to substantiate a statement as to the relationship of television to education for leisure.

Recreation Personnel

Several studies on recreation leadership personnel appeared during the period covered by this review. Person (18) reported on means of selection of students for college training in recreation. French and others (9) studied supply and placement of college recreation graduates. Anderson (3) and Finske (8) enumerated qualities important in recreation leaders. A comprehensive statewide study (5) was completed in California on

many factors affecting recreation personnel. The trend was to carry on more research of this type. Leaders properly selected and adequately trained are fundamental to organized procedures in education for leisure. They are necessary to give direct leadership in development of recreation skills and attitudes, to provide guidance and counseling in leisure activities, to assist educational personnel not previously trained in recreation to discharge their general responsibilities in education for leisure, and to correlate the school's program of education for leisure with the participation opportunities offered by community agencies outside the schools.

Statewide Studies

A decided trend in present recreation research stresses the importance of developing a comprehensive account of the status of recreation on a statewide basis. During the period covered by this review several studies of this type have been completed and published. They have indirect relationship to education for leisure in that they provide an over-all view of the setting in which education for leisure is a part. Recent studies of this type have been made in Alabama (2), California (19), Minnesota (13), New Mexico (6), and Ohio (10). In general they point out the importance of state level responsibility in assisting communities to meet their recreation needs.

Needed Research

While there are many neglected areas of research in education for leisure, it would appear that the following merit consideration for inclusion in any priority listing that may be conceived: (a) Relationships between the school program of education for leisure and the participation offerings of community agencies outside the school. (b) The place of the classroom teacher and specific parts of the curriculum in education for leisure. (c) The relationship between student organizations and education for leisure. (d) The relationship of extracurriculum activities to education for leisure. (e) The relationship of teacher preparation to education for leisure. (f) The relationship of the teacher's personal pattern of recreation interests and skills to education for leisure. (g) Methods in developing coordination between the home and the school in education for leisure.

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CHAPTER V

Home and Family-Life Education

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DURING the three years since the previous review on this topic appeared, a very considerable amount of research dealing with homes and family members has been completed. Much of this research has implications for education since it often shows what needs to be taught or discloses facts and principles useful in guiding students in the solution of problems of everyday living in homes. Studies showing nutritional lacks of children or adults, or showing undesirable food habits, problems of adolescents in relationships with parents or siblings, lacks in essential information on the part of consumers, or effects of housing on family life, are all illustrations of research which is grist for the mill of the educator, especially the curriculum worker in the field of home and family life.

Psychological studies of the behavior of those who live in families from the nursery-school years to the most elderly person now served by adult education are also pertinent to education for family life. So, too, the research into family behavior and into community life in its relations to families can supply information for the educator in this field. What should be taught to students from the elementary level to the advanced graduate level or in adult education can be ascertained best at times by a study of how people now behave, what they know or do not know, and what attitudes they have which will encourage or block their learning. Yet these studies of people as they are individually or as they behave in relation to others cannot be reviewed here, altho it should be remembered that they supply one type of essential tool material for the educator.

Studies reviewed in this chapter are those dealing rather directly with teaching in the field of home and family-life education. Even with this limitation the scope is broad, since it includes studies treating of courses and curriculums, educational theory and procedures, students' problems and abilities, and administrative problems. Also, since family-life education is now becoming a recognized part of the responsibility of the schools from nursery schools to adult groups as well as in the graduate college, the scope of this review must be great.

Most of the research to be reported is from doctoral or professional studies, since few master's studies are published and the majority are of necessity very limited in scope and importance. Among the doctor's studies appearing in the annual list of studies in education published by Phi Delta Kappa (17) the majority of the thirty-three studies in progress in this area from 1947 to 1950 dealt with curriculum at the college level or with evaluation. A smaller number treated the development of family-

life education and problems of administration. Still fewer were studies of methods of teaching. Evaluation of course, programs, and methods of teaching were emphasized in studies selected for this REVIEW.

Curriculum

The place of home economics in the general education of students in colleges and universities was studied by Ekstrom (12). Home economics was usually thought of by home economists as a highly specialized area of learning. They commonly considered general education to be some specific body of subjectmatter to be required of all students but disagreed sharply upon the content to be included. Home economics was believed to have contributed to the education of students to take an active part in social change mainly thru its contribution to technological development.

College courses in home management in all the four-year colleges and universities that had home-management residences in 1945 were studied by Elliott (13). Replies from 106 institutions in 88 percent of the states were used to draw up recommendations for aims, emphasis in courses, credit hours for residence, and ways to involve students in planning their own learning in order to strengthen certain weaknesses that were found. A jury of experts in the field evaluated the recommendations that were to be used as guides to practice.

Home-management theory courses were found to be stressing subject-matter, as follows, in descending order of percent of frequency: efficiency-time and energy management, fatigue, housekeeping management, philosophy of management, management of family foods, finances, housing, health, recreation, and community relations. In addition to a theoretical course, residence in a home-management house was usually required of all economics majors. Most of the houses were operated on a moderate or low income level and definite duties and experiences were planned for the students.

Teaching Methods and Materials

Typical of a number of studies at the elementary-school level is the effort to find methods of teaching nutrition to elementary-school children that will actually effect change in their eating habits. Cline, Johnson, and Lamb (9) used white rats to demonstrate results of different diets, served foods at school, and used several other methods during a six-week unit on nutrition in the fourth grade. Checklists and diet lists collected before and after the unit, reports from parents at the end, and tests of information showed the children were able to select accurately from foods presented those that were protective foods, those that would help them to grow, and foods from different food classes. Parents reported the children as being most impressed by the white rat experiment and by the foods served in class. Some changes in habits were noted.

Jackson (18) prepared two source books for teachers in elementary schools to use in teaching a nutrition unit, "a good breakfast"; one for Grades I to III, the other for Grades IV thru VI. Included in the materials were photographs, charts, and other illustrative materials for use with the children, suggested activities, evaluation devices, and references. After the materials were evaluated by a jury of forty-eight home economists, including teachers with experience at the elementary-school level, the revised source books were used by 107 teachers from representative city, village, and rural schools in twenty-nine states. Reports of these teachers and evaluation devices used by them were analyzed to determine usefulness of the materials. The source units were also appraised by educators from twenty agencies and from various regions. Recommendations were then formulated for producing a set of educational materials to be published and distributed nationally.

A helpful device to encourage students to think about the home in terms of functions to satisfy values was developed by Cutler (11). A "Home Values Test" using ten values, namely: comfort, convenience, beauty, friendship, health, economy, location, personal interest, privacy, and safety, was developed and validated. With this test the instructor might appraise the values of her students at the beginning of the course and know where to begin in planning to meet their needs.

The current emphasis on pupil-teacher planning is reflected in an experimental study by O'Reilly (25) for the Division of Education and Applied Psychology at Purdue University. Twenty boys and girls from the upper three high-school grades chose their subjects for study, method of presentation, and method of evaluation throughout a course in problems of personal and family living, with the teacher serving as a cooperator and helper when she was thought to be needed. Frequent evaluations of the total class experience indicated that students believed they had gained in ability to participate more democratically in groups, to do cooperative planning for the group, and had gained in willingness to talk over problems with an understanding and informed person. Increased respect for differences in beliefs and increased understanding of self were believed achieved.

That projected visual aids may be a more effective addition to discussion than reference reading was suggested but not proved by an experimental study in which a control and an experimental group were taught to discuss and required readings in a two-week unit on nutrition. Initially there was no significant difference between the groups in intelligence quotient, chronological age, or knowledge of nutrition, as shown by a pretest which had been tested for reliability. Upon retest five weeks after the completion of the unit, the experimental group had made greater gain in knowledge, but not sufficiently greater to be significant. Results of a second retest in the next term were the same.

Effectiveness of Courses and Programs

Continued interest in evaluation and an increase in the preparation of well-conceived and carefully-tested instruments for use in making adequate appraisals are evident in recent research. The scope of studies has also broadened, for more studies of the effectiveness of entire programs than of courses were found in the literature. Cozine (10) studied the effectiveness of the food and nutrition work at the seven state-supported schools in Missouri. Four types of objectives from those submitted by the teachers of foods and nutrition at each school were selected for special study. Four instruments were prepared and used to measure the achievement of beginning and advanced students at each school. Coefficients of reliability for each device were sufficiently high to assume that the devices measured adequately the objectives in question. Validity was checked by a jury of thirteen faculty judges from the cooperating institutions and acceptable validity was claimed. Conclusions were based on scores from the *Interest Inventory*, the *Information and Association Test*, the *Application of Principles Test*, and the *Points of View Test* of attitudes, administered to beginning students just enrolled in the first foods course and to advanced students who had completed or were nearly thru their last prescribed foods course. Differences in the scores of the two groups were used to determine adequacy of the courses. Assuming likeness of the two groups, no means were used to hold constant the differences that might have been due to intellectual ability, home background, or differences in previous education. Since advanced students made higher scores, it was concluded that the program was contributing effectively to the acquisition of information and to ability to recognize relationships between specific facts and related principles. Less effective contribution of the program to ability to apply principles to new situations, and ineffective development of desirable interests and attitudes were concluded. The evaluation instruments might be used with other groups working toward the same objectives to see if pre- and post-testing of the same groups at the beginning and end of their program would show the same results.

Effectiveness of an experimental curriculum designed for the freshman year at Purdue University was proved by Baird (4) in respect to growth in personal adjustment, development of favorable attitudes toward basic subjectmatter in home economics, and equal achievement with a control group altho less classroom time was devoted to instruction by the experimental group. Scores on three tests and analyses of adviser's interview records furnished the evidence. A home economics test, an *American Council on Education Psychological Test*, and the *Purdue English Placement Test* were used to match the groups studied.

A real contribution to technics for determining the effectiveness of an entire college program of home economics was made by the publication of criteria for evaluating college programs by the American Home Economics Association (2). Altho these criteria and the bulletin giving the

evaluation device (2, Appendix B) are not research in the usual sense, they mark a significant step toward encouraging research by providing a much needed instrument.

Also, the effectiveness of state and local programs of homemaking for adults can be studied now more readily by the use of evaluative criteria and an outline of ways and means for collecting evidences of their achievement, which were developed and used by Ford (15) in Iowa. Further testing of the devices in more situations is needed.

Typical of numerous surveys conducted to determine the effectiveness of a county program of adult education for rural living, in which family-life education has a part, is the study by Niederfrank (24) for a county in New Hampshire. By field interviews of every third family along the roads in eleven selected townships, the proportion of those reached and the extent of their utilization of instruction was examined. As is so often the case, the least participation was among those families with a low level of living, little previous education, and few contacts from which to get more. Especially interesting was the fact that men as well as women indicated a desire for further information and help with problems of family life including children, nutrition, and health. From 10 to 15 percent of the men indicated such interest while from 30 to 50 percent of the women wanted help with these problems. Frequent evaluation by carefully conducted and unbiased studies of the coverage, usefulness, and unmet needs of such programs is an important process in up-grading an educational program.

Effectiveness of off-campus experience, other than student teaching, as required by two colleges in the curriculum in home economics was studied by Mallory (23). The students showed growth in those personal qualities believed important in a democracy but showed no evidence of conscious use of the work experience to clarify their values even when changes in values were found after the experience. The off-campus work experience ranged in length from four to sixteen weeks altho 75 percent worked eight weeks. About one-third or less did unpaid work. A wide variety of materials was used in evaluating the effectiveness of this part of the curriculum including before and after tests, written records of students, reports of the experience filed by students, and two logs kept during the work period.

The effect of a single four-week unit in consumer buying was found by Baten and Hatcher (5) to result in differences among schools but little difference between eleventh- and twelfth-grade classes within schools. Scores on a final paper-and-pencil test were used and IQ scores were held constant by using analysis of covariance.

In addition to the battery of evaluation devices prepared by Cozine (10) and the twelve instruments for evaluating food practices of elementary-school children prepared by Tinsley (31), two doctoral studies and a compilation of tests developed and tested as master's studies provided

new evaluation instruments of possible usefulness to other research. Amberson (1) constructed a *Problems in Family Living* test designed to reveal patterns of values for family life among college students and home economics teachers. Value hierarchies were located. A significant difference existed between test scores of best and poorest teachers of home economics from twenty-seven states. Value patterns of students changed during the four years of college toward similarity with value patterns of superior teachers.

Stedman (29) developed, tested, and refined two forms of a scale designed to measure knowledge of and attitudes toward child behavior. Reliability of the two equivalent forty-item forms was .89. Scores on this test were significantly related to educational level since it differentiated between high school and adults and between upper- and lower-class college groups. Evaluation of experience in a nursery school education group can be made by means of a *Situation Test* devised and validated by Read (28). Together these tests might be used to determine effectiveness of courses in child development.

Testing the effectiveness of instruction about adolescent development is possible with tests developed by Brown (6). Two aspects of ability of teachers to apply principles can be tested with *Test A, Recognition of Principles* and *Test B, Case of Jacqueline Croner*. Corrected split-halves reliability coefficients were .85 and .91, respectively. Validity was established on two separate bases. Regression equations were developed and tested. It was found that the ability of individual teachers to apply principles can be measured satisfactorily by these tests without the observation and interview technics with which they were compared.

Paper-and-pencil tests designed to determine ability of high-school pupils to apply generalizations in the areas of (a) family and social relations, and (b) foods and nutrition are also available with keys and directions for preparing similar tests in a bulletin by Chadderdon and others (7).

Student Abilities, Attitudes, Problems

Concern for the social development of adolescents and the factors that may be affecting such development was shown in four studies. A very substantial relationship between social understanding of high-school girls and their intelligence was found by Lehman and Long (20). Less direct relationship was found between scores on home environment and social understanding as measured by a five-point intensity-of-feeling scale used to record reactions toward social situations. The same was true when personality scores and social understanding were compared. A retest by Long (22) of seventy-eight adolescents of this group at the end of two years showed uneven social development since the previous test. Those with good home environment and reasonable intelligence had as a rule made excellent progress in social understanding. On the other hand, more

than one-half of those with average intelligence scores were below the average of the group on personal adjustment or had lost ground in the two years. Maturing socially seems to be an individual matter rather than a steady upward process.

Wolford (33) found nondating seniors in high school had less wholesome relationships with parents and less wholesome feeling of self-regard than those who dated. Specific need for guidance by a mature person that could in part be met in family-life education was apparent. Using the Mooney *Problem Check List* and a measure of sociometric status, Kuhlen and Bretsch (19) found that among 700 ninth-grade pupils those least accepted by their grade-mates had personal difficulties more often than did the popular children. Predominating difficulties were related to social skill, lack of status, and family problems.

Recommendations for family-life education for high-school youth based on their personal and family problems were made by Williams (32) after a study of the problems of 1501 high-school youth in urban, suburban, and rural communities in Michigan and Georgia. Questionnaires, discussion groups, and 100 interviews were used to collect the problems. It was recommended that: (a) courses on youth problems and personal adjustment be required in high school emphasizing clothes, appearance, social behavior, and being normal; (b) for both parents and youth, education be provided in attitudes toward dating, in reciprocal understanding of points of view, and in importance of sharing responsibilities, work, and play.

Well over one-fourth of the girls felt themselves failures in dating and courtship; almost one-third feared dating but thought it very important. Youth generally and boys especially felt strongly a need for material possessions to give them status with girls. A majority had wholesome attitudes toward their homes but almost one-half were not finding the companionship or partnership they thought they needed. About one-fourth did not talk problems over with parents but felt a need to do so.

Interest patterns identified by the *Kuder Preference Record* were found by Geiger and Evans (16) to distinguish between groups of women employed in or preparing to be dietitians and those in merchandising and in teaching. These interest patterns, together with other information about students, should be useful in counseling college women.

Administration

A dearth of college students preparing for teaching and other leadership positions in family-life education posed problems for the administrator. These are highlighted by research in the past three years.

Lehman (21) studied the reports on "Home Economics in Degree-Granting Institutions" from the U. S. Office of Education. Most of the home economics students in college were enrolled in large publicly-supported institutions altho a significant number were attending privately-

supported institutions with small departments. Great variation was found among the schools in the extent and content of course work in the undergraduate major. Comparatively few students were being prepared to supply the need for leadership.

Replies for ninety-one presidents to an inquiry sent by Phillips (26) to 268 normal schools and teachers' colleges in thirty-four states and the District of Columbia indicated an expected increase of 160 from 1946-1950, or double their current home economics staff. In light of the study by Lehman (21), the proposed increase could probably not be made.

In an effort to find factors that affect the supply of home economics teachers in secondary schools, the Research Committee of the Home Economics Section of the American Vocational Association (3) began in 1946 a study of factors associated with satisfactions home economics teachers have in their jobs. After preliminary studies to develop technics, a nationwide study was undertaken. A random sample of 125 teachers from each of thirty-four states and all teachers in twelve states were sent forms, of which 91 percent were returned. A subsample of 971 from the 4668 were drawn for detailed analyses. State data were later used by the individual states.

Factors studied in relation to the general satisfaction score were community conditions, living conditions, marriage and family, salary, professional satisfactions, school conditions, and teaching load. Teachers from communities over 2500 in population had higher job satisfaction scores than those in rural communities. Community attitudes toward teachers and the conditions under which they had to live were two important factors in satisfactions with the job. Low salaries were a source of considerable dissatisfaction. In contrast, marital status did not influence satisfaction.

Teaching loads varied widely within and among states, but load-size had a low negative correlation with job satisfaction. Relation of school conditions to job satisfaction also varied widely from state to state.

It is evident that higher salaries, altho important to satisfactions in teaching home economics, are not the only adjustment needed if teachers are to be drawn to this field and retained therein. Interesting hypotheses for many more studies are suggested by this investigation.

Needed Research

Areas pointed out as needing research in 1947 continue to need study today. Additional tools for use in evaluation and for determining the grade levels at which emphasis upon education for family life would be most effective are much needed. Radio, including television, and newspapers as media for reaching a wider adult public with family-life education should be explored by research. Appropriate types and suitable uses of projected visual aids to insure effective education in this field also need study. With the increased volume of doctoral studies completed

since the last review one may hope there is also an increase in number of well-prepared research workers able to attack some of the problems suggested here. Two thought provoking articles (8, 30) recently outlined areas and problems much in need of research in family life. Education in this field awaits answers from such research as a factual foundation to use in teaching.

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CHAPTER VI

Industrial Education

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THIS chapter summarizes research in both industrial arts education and vocational industrial education which has been done during the period covered by the past several cycles of the REVIEW.

I. Industrial Arts Education*

Research in the area of industrial arts education continues to be conducted primarily by persons working individually and in connection with earning graduate degrees. Unfortunately only a few of these studies are made available thru publication. There is, therefore, a general lack of coordination among the studies, and the findings exert only a modicum of influence.

The degree-earning studies presented in this review were selected from a large potential. Each such study was rated as "outstanding" or "superior" by an adviser in a college or university where industrial arts graduate degrees are offered.

Teacher Education

Seventeen studies were reported in this area; eight were doctoral theses. Gallington (35) prepared a checklist having considerable diagnostic merit for use in the evaluation of teacher-education programs. Maley (66) developed a scale for appraising student teaching and, thru its use, found a marked discrepancy between intellectually held procedures and prevailing practices, even in institutions where superior programs prevailed. Giachino (37) explored the relationships between experiences offered by teacher-education institutions and the qualities considered by supervisors of industrial arts as contributing to success in teaching. Baab (6) concluded that the emphasis placed on general shop instruction in present teacher-education programs in Colorado is justified. Siro (77) confirmed a need for both unit and general shop experiences. Kjos (55) studied the problem of preparing teachers for one-teacher programs. Alsip (2) stated that effective rating of student teachers requires a minimum of two twenty-minute observations per week followed by a conference. Lee (61) urged that student teachers be rated on individual lessons or demonstrations as well as on a term basis.

* Prepared by R. Lee Hornbake.

Siro (77) found that, for a "major" in industrial arts, the median institution requires twenty-nine semester hours of shop courses, ten of elective shop courses, six of required theory, and three and one-half of elective theory courses. He reported that 27 percent of the teacher educators had had no teaching experience prior to college teaching. Tate (79) listed 235 separate technical courses and fifty-one separate professional courses offered in fifty-one teacher-education programs. Butcher (14) examined certification procedures in forty-five states. Shop course requirements range from twelve to forty-four semester hours. Reciprocity provisions are indefinite, interpretations are influenced by teacher supply and demand.

The American Industrial Arts Association *Directory* for 1948 (3) listed 164 institutions involved in teacher education with a total staff of 869 persons. Fifty-one institutions reported offering the master's degree and twenty the doctorate. Gerbracht (36) brought together data heretofore not available. In thirty-four states, he found that 17,131 industrial arts teachers were employed; he estimated 20,000 for the nation. In twenty-six states, industrial arts is offered in only 45 percent of the public secondary schools. On a nationwide basis an undersupply of industrial arts teachers will prevail thru 1952; a serious oversupply will occur after that date. With twenty-eight states reporting, fifteen are currently producing industrial arts teachers in excess of their own secondary-school demand.

Kleintjes (56) planned a transportation program for the teacher-education level. Fowler (33), in a college-level wood-working course, compared operation sheets with process models. Operation sheets proved superior in the students' informational achievement, in quality of work produced, and in skill development. There was little difference in time required for project construction. De Vore (23) recommended that teacher-education institutions develop safety training programs and that a course in safety be required.

Wilber (82) measured the social acceptance of 102 juniors and seniors then checked their professional achievements eight years later. Fourteen of nineteen men, "superior" by one sigma above the median, were conducting successful or highly successful programs. Five of twelve rating one sigma below the median were conducting successful programs, none outstanding. Johnson (51) studied entire classes of freshmen and sophomores. He found uniformly low scores on the numerical reasoning subtests on mental maturity. Five of twenty freshmen and four of twenty sophomores had a silent reading ability of Grade XIII or more, as measured on the *Iowa Silent Reading Test*.

Content and Method at the Secondary Level

Cooper (17) recommended that aeronautics content be divided into six major categories: (a) aerodynamics, (b) power plants, (c) aircraft de-

sign, (d) aerial navigation, (e) meteorology, and (f) communications. Dietrich (25) would have aviation a part of transportation with the time spent on it proportionate to the relative importance of aviation in our national economy. Drazek (27) prepared a resource unit in electricity-electronics in six categories: (a) generation and transmission, (b) light, (c) mechanical energy, (d) heat, (e) communications, and (f) electro-chemistry. The teaching materials recommended were used in an experimental course.

Adams (1) determined the electrical skills and understandings needed by persons living on electrified farms and assayed the specific contribution of industrial arts.

Byron (15) followed up 204 automobile accidents to learn what factors may be influenced thru driver education. In 144 of 204 cases, the attitude of the driver was involved (inattention, traffic violation, right-of-way controversy). Fuzak (34) developed two forms of a scale to evaluate cooperative attitudes in industrial arts classes. The scale promises to be less time consuming in its application than the time-sampling and anecdotal procedures. The use of the scale results in an index for the individual pupil.

Baker (8) urged the concept of student management rather than pupil personnel. He proposed that pupils participate in planning for student management. Harris (44) studied thirty-seven "successful" general shop teachers to determine how they got their beginning classes under way. Seventy-nine percent provided for pupil planning, 80 percent had pupil personnel systems.

Anderson (5) reviewed industrial arts syllabi of twenty-three states. Twenty-five different objectives were proclaimed, one state with fifteen. The average was seven. The top ranking objective was: "To develop elementary skills in the use of common tools and machines." The second pertained to vocational guidance, the third to consumer literacy. An avocational purpose was mentioned in six of the statements. The harnessing of industrial arts programs to the advancement of undeveloped industries within a state was proposed by Kolitz (58).

King (54) found left-handed pupils handicapped most in printing, in jointer, router, and drill press operation, and in lettering. His study made recommendations for the instruction of left-handed persons.

Reynolds (76) found that the average maximum number of industrial arts credits permitted for high-school graduation is 4.8.

History

Bawden (11) presented a series of biographical studies of industrial education leaders, leaders whom he has known personally. Woodward, Richards, Bonser, Griffith, Runkel, Harvey, Stout, Roberts, and Struck are included. McCain (63) in an historical study of the school shop

program in one city approached the problem not in the conventional manner but rather by examining population factors, finance, industrial development, political conditions, and labor. Miller (67) found that in eighty-three school surveys 199 recommendations had been made relating to industrial arts. Eighty-three percent of the recommendations made between 1918-1931 had resulted in positive action. Karnes (52) formed fourteen generalizations about the attitude of organized labor toward industrial education. Labor has consistently favored a broad, basic, general industrial training over narrow, specific instruction at the pre-employment level. Phillips (73), in his study of inventions, concluded that the cultures which survive and prosper are those which promote an ever-developing system of education which reflects the inventive process.

Shop Planning

Bollinger (13) summarized principles for school shop planning growing out of his participation in designing several hundred school shops. Maley (65) recommended procedures for reducing school shop noises, including care and mounting of machines, types of partition construction, and the applications of insulating materials.

Professional and Public Relations

Baab (7) reported on attitudes of Colorado school administrators toward industrial arts. The administrators would like to increase the areas of work offered and are desirous of admitting girls to classes. They believed industrial arts teachers should be able to offer instruction in a variety of media and they should likewise have competency in another subject field. Dunlap (28) found a close relationship between the information which the school and community has about its industrial arts program and the support they gave it. He urged that the focus of the information be upon the learning opportunities rather than upon projects produced.

Ohio industrial arts teachers, according to McArthur (62), look to the state supervisor to develop a long-range program and to upgrade the present program. They urged the development of a staff to the point where supervision on a county basis would be possible.

Research Reviews

The National Association of Industrial Teacher Trainers (4) made a listing of 2002 studies. The studies dated from January 1930 to September 1948. Comments and annotations were included for 1396 of the studies. Feirer (32) reported on the status of research leading to advanced degrees in industrial arts education. One trend is toward making the thesis optional for the master's degree.

Aptitudes and Abilities

Cottingham (18) found some evidence for supporting the theory that mechanical aptitude is a trait unique with respect to intelligence, altho the evidence is somewhat contradictory. Uniformly low coefficients between school marks and mechanical aptitude were obtained. High (47) gave tests of mental ability, mechanical comprehension, mechanical aptitude, personality adjustment, interests, and vision to seventy-five ninth-grade boys. It was concluded that the *Otis S. A. Test of Mental Ability* and the *Minnesota Paper Form Board Test* would be of most diagnostic value to the general shop teacher.

Related Studies

A large number of studies which have findings relevant to industrial arts have been conducted during this period by nonindustrial arts people and institutions. Nine of these studies are cited here.

Tyler (80) proposed a definition of educability which would include the development of a variety of talents and the recognition of achievement in different areas and on different levels of performance in addition to those which are now in high regard in schools and colleges. His data bear directly upon success in school, pupil motivation, and the social values of education. Davis (21) supported Tyler's thesis and stated that schools arbitrarily restrict the goals of pupils and activities to a very narrow range of activities. He urged a problem-solving approach, with initial school enterprises drawn from the daily life of the children.

Dillon (26) interviewed 1100 individuals who dropped out of school early and found that no one experience or service program would have been effective in holding them. A series of new elements or educational experiences must be provided if the needs and interests of potential school leavers are to be met successfully. Gragg (38) found in two city systems the most significant factor distinguishing the drop-out from the graduate was retardation.

The National Association of Secondary-School Principals (70) devoted the March 1947 issue of its *Bulletin* to the "imperative needs of youth." All ten needs listed in this bulletin have implications for industrial arts. Number one emphasizes the need for developing salable skills, number five deals with consumer understandings, and number eight cites the need for personally satisfying and socially useful leisure-time pursuits.

Edwards and Richey (29) provided data on the progress of invention and technology and the growth of industrialism with the resultant impact on American life. Of particular concern are the facts pertaining to occupational shifts, labor displacement, and skill demands. Warner (81) presented an account of the internal social structure of a modern factory, and the plant and community interaction. The project was essentially the study of the behavior of people in an industrial community.

Redmon (75) cited stratification in industry as a deterrent to the satisfaction of individual drives and motives. The data of the Dewhurst study (24) are of significance to those teachers who wish to anticipate some of the material features of the society in which the present school population will live its adult life.

Reactions

No study dealing with elementary-school industrial arts was reported for this period. Despite extensive school building programs in many parts of the country, only two reports were made on school shop planning. Two studies (6, 77) carried a recommendation for shop courses on the graduate level. Since an increasing number of schools are entering upon graduate work, this recommendation should be studied carefully so that the master's degree does not become a shop "makeup" program. The Life-Adjustment Education for Youth Enterprise has not given rise to complementary research in industrial arts education. Very few of the studies which were reported involved experimentation.

II. Vocational Industrial Education*

The term "vocational industrial education" is becoming much broader than it has been in the past and is no longer confined to the trade or vocational school. Industrial training, technical education, and apprentice training are becoming recognized as important parts of vocational industrial education.

A review of the studies in vocational industrial education indicates that many are made on a rather subjective basis and result in data that are difficult to evaluate specifically. Considerable emphasis is still being given to surveys of local communities and of industrial education programs. Some recommendations for programs or changes in specific programs are offered.

Of significance this past year has been the publication of an annotated bibliography of studies made in industrial education for the period 1930 to September 1948 (12). This bibliography covers the areas of industrial arts education, technical education, and vocational industrial education and includes 2002 studies completed by graduate students working toward advanced degrees. It is anticipated that future publications will be forthcoming so that the bibliography may be kept up to date.

Preparation of Instructional Materials

During World War II, many curriculum laboratories were established in connection with the War Production Training Program. A carry-over from these laboratories is the attention that has been placed on the

* Prepared by C. Kenneth Beach.

development of instructional materials. Colleges are apparently moving into the field of preparing instructional materials for apprenticeship programs, vocational and technical high schools, and diversified part-time cooperative programs (9). The courses and materials are developed in cooperation with state boards for vocational education, state apprenticeship commissions, local boards of education, and college faculty. A recognition of the need for a more critical evaluation and review of related materials is evident (74). Hampton (42) reports that nineteen curriculum laboratories are being operated in eighteen states with state education departments responsible for the supervision in seventeen of the laboratories. There is an apparent need for closer coordination on a national scale in order to avoid needless duplication of materials. With the emphasis that is being placed on this area, teacher-training institutions have a responsibility for developing personnel to write instructional materials.

More persons lose jobs because of their inability to get along with fellow workers than because of a lack of technical skill, therefore materials are being prepared on subjects concerned with personal adjustments and industrial and labor relations (39).

Apprentice Training

Considerable attention has been given to apprentice training in the past few years. Three organizations largely responsible for this attention were the Apprentice Training Service of the U. S. Department of Labor, State Apprentice Training Councils, and the U. S. Veterans Administration. Altho the number of registered apprentices was the highest in the nation's history, current studies indicated that there was a growing shortage of trained craftsmen. The carpentry trade in California was reported to be undersupplied with apprentices by about 75 percent (64, 69, 83). The rate of apprentice mortality has been high. Woodington (83) reported an average turnover for a ten-year period of 73 percent. A major factor has been the dropping of apprentices from classes because of their lack of interest or dissatisfaction with the conduct of classes (50). Altho skilled labor force has increased from 5.9 to 8.2 million, apprenticeship has accounted for not more than 9 percent of the increase (69).

Technical Education

Technical education continues to receive emphasis, tho enrolments have decreased slightly in the past year. With technological developments continuing to increase, the demand for trained technicians is apparent. The result has been an increased concentration in vocational industrial schools in the technical areas (48).

Smith (78) in his annual survey for 1949-50 found an enrolment of 32,435 in sixty-six technical institutes, a decrease of 3 percent as com-

pared to 33,326 technical students enrolled in sixty-two schools in 1948-49. Enrolment of evening and special students increased 3 percent. Total enrolment decreased 0.7 percent as compared with that of a year ago. With numerous new buildings and additions reported, it appeared that many technical institutes had been able to obtain money for capital expenditures. The establishment of many new technical institutes in recent years has resulted in studies of curriculums and organization (20, 46, 71).

Evolving Concepts

Educators are concerning themselves with possible vocational industrial programs that might be conducted in the smaller communities or the more rural areas. Nonindustrial areas in general are not providing pre-vocational experiences for high-school youth (19). Small high schools are unable to finance vocational training where extensive facilities are required (72). To meet this problem, area vocational schools and diversified part-time cooperative programs are being recommended. Cooperative programs are also being recommended in nonapprenticeable trades or occupations (57).

There is a growing development toward the appointment of regional supervisors of vocational industrial education, resulting in decentralization of state supervision (10).

A general trend appears to be developing toward utilizing cosmopolitan high schools wherein vocational industrial education courses are a department in the school. With such developments, confusion between the academic administrator and the director of industrial education tends to exist (49). Too frequently administrators are concerned primarily with installing a program of trade and industrial education and not with operating the program efficiently. In many cases this is due to failure to recognize and identify specific duties and responsibilities involved with the program (45).

Dejaiffe (22) studied the organization and content of vocationally related mathematics in general high schools. He pointed out the need for related courses in nontechnical fields for vocational-school students and questioned the teaching of the same technical subjectmatter, which was in most cases college preparatory in character, to academic and vocational people.

Morton (68) compared day trade and nonvocational senior students to determine differences that might exist between the two groups. He found that students of lower ability tended to gravitate toward vocational courses or were advised to take such courses. Student selection in vocational industrial schools has continued to receive consideration, as did the problem of establishing objective grading methods for shop projects (43, 60).

The evolving concepts of industrial education in the thinking of organ-

ized labor was studied by Karnes (52). It was apparent to Karnes that the attitudes and policies of organized labor toward vocational industrial education were changing, with greater emphasis being placed on apprentice training and with vocational schools providing the related instruction.

The preparation of vocational industrial teachers thru courses conducted jointly by industry and colleges or universities received attention (30). Certification requirements for these teachers are tending to become more uniform, and 82 percent of the states were reported to have specific written requirements (77). However, the number of colleges or universities offering degrees in vocational education was relatively small (43).

Industrial Training

With the organization of training directors on both the state and national level, research in the area of industrial training received encouragement. Emerson (31) reported from a national survey of training directors that the supervisory group in industry was the most important group for which research was needed, with evaluation of training programs being second, and conveying of industrial economics to workers third. Industrial trainers stressed the evaluation of training programs (53). Persons responsible for training in industry are placing more emphasis on the development of economic understanding among employees in their training programs (31, 59). Guyon (40) made a survey of training directors relative to their status and duties. Thirty-one percent of the training directors reported directly to the president of the company while 87 percent were no more than three (organizational) steps away from the president. The findings also pointed out reasons why institutions of higher education should further develop the profession of training director. Since line personnel determines most of the broad values in plant-wide culture of workers, it should maintain a close relationship with training and wherever possible do the training (41).

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CHAPTER VII

Business Education

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MANY research studies in business education have been completed in the three-year period since the REVIEW last carried a report in this area. As the basis for this summary well over a hundred studies were reviewed. From these, certain ones which seemed to throw light on new practices and problems were selected for inclusion. The studies reported fall chiefly in the four main areas of business education: stenographic (including typewriting), bookkeeping, clerical, and distributive. These studies have for the most part dealt with teaching methods, testing, and curriculum. They point the way in many cases to the need for additional research.

Trends

Enterline (5) made an analysis of the trends of thinking on the part of leaders in the field of secondary business education relating to eight basic areas derived from the literature between the years 1919 and 1941. Two hundred ninety generalizations were prepared, each of which was checked against commonly accepted educational principles, which were used as evaluative criteria. These generalizations represent an expression of the philosophy of business education insofar as an expression of such a philosophy is possible. Howard (9) found that more colleges offered typewriting and gave credit for the course than was the case in 1941-1944. The average college offered three semesters of typewriting with credit ranging from 1.5 semester hours for personal-use typewriting to 2.4 semester hours for intermediate typewriting, and 3 semester hours for advanced typewriting. Class hours ranged from four to five a week.

Shorthand and Transcription

Veon (26) analyzed the psychological processes involved in learning Gregg Shorthand for the purpose of comparing shorthand learning processes with those of modern languages. She reported significant positive correlations between the shorthand criterion and certain sections of the *Iowa Placement Examinations*, *Foreign Language Aptitude Tests*. She also reported positive significant correlations between the shorthand criterion and the *Symonds Foreign Language Prognosis Test*. She concluded that certain aspects of the foreign language aptitude tests if reconstructed after analyzing her data might result in a very substantial

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correlation for prognosis purposes. The Shorthand Committee of the Ontario Commercial Teachers Association and the Department of Educational Research of the Ontario College of Education (17) conducted two important studies that dealt with shorthand teaching practices and prediction of shorthand success. They reported that of 114 teachers reporting, 86 percent did not use any method for selecting shorthand students. Of those who used a selection practice 16 percent reported the use of some type of prognostic test and 27 percent reported a tryout period. These tryout periods ranged from six weeks to a full year. But 56 percent of the schools reported that even tho the tryout period was unsuccessful, the student may continue his study of shorthand. The study of prediction of success was designed to test the hypothesis that it is possible to predict shorthand success by means of tests used to measure shorthand aptitude. Three measures of aptitude were used: the *Turse Shorthand Aptitude Test*, the *Dominion Group Test of Intelligence*, and the *Iowa Silent Reading Test*. The criteria of success in shorthand were reading and vocabulary tests in Grade X and transcription tests in Grades XI and XII. They reported that for the total group the prediction coefficients were uniformly low. Some of the prediction coefficients for the subgroups were higher than the corresponding prediction coefficients of the total group, but they were not high enough to warrant any definite conclusions concerning a method of selecting shorthand students. Skinner (20) made a survey of the employment status of male stenographers in 145 Tennessee industries. She found that altho more than 53 percent of the office workers were men, less than 5 percent of these men were employed as stenographers. It was indicated that in Tennessee there was no trend toward employment of a great number of men in secretarial positions.

Masson (14) made a frequency count of distinctive words and collocations to be used in the training of legal stenographers. The materials from which he developed his lists consisted of the decisions rendered by the highest court of appeal in a sampling of states. He arranged his findings in four lists: the 1000 most commonly used English legal words, arranged by a family grouping; 1000 most commonly used English collocations; a list of Latin and French legal words; and a list of Latin and French legal collocations.

Typewriting

Littlejohn (13) studied the comparative effect upon ocular fatigue of four different angles of elevation of typewriting copy with the ultimate aim of determining the relative desirability. He used as criteria of ocular fatigue the gross speed, error frequency, frequency of blinking, and a test of the power of the eyes to sustain clear vision. He concluded that the most desirable degree of angle of elevation of typewriting copy for providing conditions least fatiguing to the eyes under conditions of any

fixed distance of the eyes from the copy or eye height of the typist is that position which effects the nearest approach to vertical vision at the given distance and eye height. This is effected by adjusting the elevation of the copy to a position resulting in a ninety-degree angle or line of vision with the plan of the copy at the center line of copy. This was determined to be a forty-one-degree angle of elevation. Batchelor (2) made a detailed analysis of the steps involved in the construction of two equivalent forms of a typewriting test based on an analysis of the duties performed by typists on the job. She made suggestions and charts to aid the instructor in determining achievement and in finding weaknesses of the class as a whole or of individual students. Bell (3) studied stroke intensity, syllabic intensity, and high-frequency words as factors in determining the difficulty of straight-copy typewriting material. She found that speed and control tend to improve with the increase in percent of frequently-used words and that errors do not appear to be affected by stroke intensity, syllabic intensity, and percent of frequently used words. She reported, however, that when stroke intensity above 5.5 is reached the typist tends to stroke the keys at a lower rate of speed. Taylor (22) in a similar study dealing only with the effect of syllabic intensity upon typewriting speed in straight-copy material found that students typed less words per minute as syllabic intensity was increased. Williams (28) compiled a list of 1641 high-frequency words from the Horn, Thorndike-Lorge, and Rinsland lists for use by teachers of typewriting in the construction of graded practice material or in evaluating material available in the form of textbooks or speed tests. Tidwell (23) made a study of the psychological aspects and conflicting practices in the teaching of typewriting in which he sought to identify those psychological factors concerned with motor learning and typewriting and to identify practices in the teaching of typewriting which conflict with the basic principles of skill learning which have been set forth thru experimentation.

Bookkeeping and Accounting

Robinson (18) studied current practices in the teaching of bookkeeping and accounting in twenty-five colleges and universities in Illinois, with a view toward improving the preparation of teaching of this subject in the secondary schools. He reported that less than 10 percent of the students enrolled in the elementary accounting classes planned to teach it in high school and that approximately 30 percent of the students failed the course. He also reported that very little emphasis was given to the training of bookkeeping teachers in the teacher-training institutions. Bleicher (4) made a survey of bookkeeping systems of fifty-one firms to assist in determining the desirable content of the high-school bookkeeping course. She reported that the variety of businesses, forms of organizations, variety of bookkeeping systems and activities of bookkeepers, and methods

of handling accounts indicated the need for a good understanding of general principles, for training in general office work, and for emphasis on knowledge about tax and payroll records. Estep (6) studied the value of the *American Institute of Accountants Orientation Test* in predicting the probable success of accounting students. He reported that none of those students who made scores on the test in the upper 10 percent of the group made grades of less than "C" in the course. None of those whose scores were in the lower 10 percent of the group made an "A" in the course, and 50 percent of these people failed the course. Positive correlations between the test scores and grades in accounting courses were found to be significant. Bachman (1) analyzed the bookkeeping errors commonly made by the small business owner to determine the effect of these errors on tax returns. He found a high incidence of common errors which have a marked effect on tax returns. Persons with no formal preparation in bookkeeping also were found to make more common errors than did those who had bookkeeping preparation.

General Business

The New Jersey Business Education Association in cooperation with the State Department of Education (16) made a comprehensive survey both of business education practices in the state of New Jersey and of the points of view and requirements of businessmen who employed high-school graduates. Replies to questionnaires were received from 172 principals, 165 business and industrial organizations, 979 business teachers, 163 guidance directors, and 9 teacher-training institutions. The four most significant objectives of business education reported were: (a) vocational efficiency, (b) development of personality and ideals which are most acceptable in social and business life, (c) development of the ability to adapt oneself to social and occupational change, and (d) development of sufficient breadth of background to prepare capable students to continue business training on the college level. Hicks (8) made a study of business understandings of high-school pupils as revealed thru a vocabulary test of business terms. He found that business vocabulary and understandings correlated significantly only with ability levels, and that this correlation was not changed even tho the person had previously studied business subjects. Lipstreu (12) polled forty-four of the leading authorities from the fields of consumer education, secondary education, and business education in an attempt to resolve some of the more controversial issues in consumer education. The jury was in disagreement as to whether consumer education should be a separate course or be integrated with other school experiences, altho there was a general agreement that consumer education in some form should be a required part of the secondary-school program. Gentry (7) made an analysis of application blanks from 274 business organizations in the United States to determine what the secondary schools should do to prepare young

people to fill out application blanks in a proper manner. He suggested that the schools establish a short-unit course on how to interpret and answer application forms.

Distributive Occupations

Mossin (15) made an analysis of selling performance and contentment of salesgirls in relation to school background. He found that salesgirls who had taken two or more semesters of distributive occupational subjects rated higher in selling performance than girls who had not had this kind of preparation. He failed to find a significant correlation between selling performance and either scholastic achievement or number of credits earned in high school. It is also interesting to note that he found that girls with background preparation for selling were more contented in their jobs than those without such background.

Toll (24) made a study of twenty chain stores to determine and analyze their policies and practices with regard to the formal training given to their present and prospective supervisors and managers. He found that major importance and emphasis was given to such training elements as training surveys, job analysis, selection of trainees, visual aids, central training schools, training manuals, trainer's guides, and measurement of training progress. He reported that most of the store-management training programs were conducted as on-the-job training programs.

Weale (27) made an analysis of the distributive education program in the state of New York by comparing what coordinators and teachers thought they were doing with what the retailer thought should be done to prepare young people for the field of retailing. He derived a basic list of forty-four skills and knowledges upon which both employers and educators in the field agreed as being essential for store workers. He found considerable disagreement on items concerning who should do the training, while on others there was substantial agreement. He also found that the employers put considerable emphasis on the need for machine training on the part of the employees.

Clerical

Liles (17) made a study of clerical workers to determine the validity of clerical aptitude tests and to explore the value of intelligence tests for predicting clerical aptitude. His study included also the determination of skills, knowledges, and personal characteristics considered important by employers in measuring success in clerical work and the determination of the activities of clerical workers. He limited his study to twenty-four firms and 100 employees in Atlanta, Georgia. He found an unusually high positive correlation between the criterion of success in clerical work and the scores on the *Detroit Clerical Aptitudes Examination*. He reported a

low positive correlation between scholastic averages and the criterion of success in clerical work. Personality factors were found to be more important in success than were either efficiency or physical factors. Related skills such as dexterity in the handling of cards and bills, organization of materials, economy of motions, and the like, affect production of clerical workers even tho typewriting comprised the most important single activity from the standpoint of time consumed. The use of adding and calculating machines ranked next to typewriting in total hours consumed and filing ranked third among the special activities of clerical workers. A very small percentage of the workers use any kind of duplication machine, and clerical bookkeeping activities ranked near the bottom of the list of activities of clerical workers. Totty (25) studied the incidence of business mortality among 104 Negro-owned businesses and found that 64 percent of the failures were attributable to managerial incompetency. Four managerial areas of responsibility were proposed as a core to a business curriculum designed to provide managerial competency. Lauderdale (10) studied the levels of skills at which experienced specialized clerical workers in the petroleum industry operate. Primary duties were found to consume three-fourths of the work hours of specialized clerical employees. Seven types of skills, abilities, and knowledges were reported as important to successful completion of primary duties in specialized clerical positions. These included attention to detail; careful proofreading and verification of work; knowledge of general classification of accounts and of account terminology; practical knowledge of percentage, fractions, and decimals; good penmanship; dexterity of fingers and hands; and ability to concentrate. Stockman (21) investigated office employment requirements and standards demanded of high-school graduates doing beginning office work. The study was conducted by means of a questionnaire containing 300 commonly performed office tasks. Four hundred twenty-seven office workers of less than one year of experience and twenty-five employers of these office workers returned completed questionnaires. He reported that the typewriter was used by 86 percent of all beginning office employees, the adding machine by 55 percent, calculators or comptometers by 36 percent, shorthand by 45 percent, and bookkeeping by 46 percent. Beginning workers reported both that they lacked ability to operate the commonly-used office machines and to use the telephone properly, and that their English preparation was deficient. Employers criticized high-school graduates for poor spelling; inability to type forms, blanks, and to do tabulation work on the typewriter; and inability to take material in shorthand and transcribe it. Schuette (19), of the Green Bay, Wisconsin, Public Schools, studied the duties performed by 1372 office employees in 199 business firms. She found that the seven major deficiencies of beginning typists were: accuracy, speed, arrangement, spelling, erasing, punctuation, and typing of numbers. The seven major deficiencies of beginning general clerks were: use of the telephone, taking dictation, meeting the public, filing, number accuracy, using the type-

writer, and making bookkeeping entries. Of the 1372 persons employed, 278 performed duties relating to bookkeeping, which is greater than any other single group, with the single exception of the general clerk. Sixty-nine firms reported that they gave employment entrance tests, and 120 reported they called the applicant's high school for the school's record before employing the worker. There were 104 firms which reported that they would be interested in employing high-school students on a cooperative basis.

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CHAPTER VIII

Agricultural Education

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WHILE education in agriculture is primarily concerned with education for work, increased attention has been focused recently on some of the contributions it should make to citizenship and leisure. Farming, as the major occupation in agriculture, is unique in the extent to which work, citizenship, and leisure are interrelated in the lives of those engaged therein. Similarly, education in agriculture, and especially vocational education in agriculture, is unique in the opportunities available for utilizing community resources to provide learning activities that contribute to the attainment of these worthy objectives.

It is not surprising, therefore, that research in this field should no longer be confined to the area of education for proficiency in work activities. Indeed, the expanding objectives in agricultural education to encompass citizenship and leisure-time activities have been the major cause of one of the most pressing problems confronting vocational agriculture on the secondary level. This problem is heightened by the fact that duties and responsibilities of the teacher are constantly increasing in complexity and number.

Primary consideration, therefore, is given in this summary to studies related to the growing concept of vocational education in agriculture and to the teacher-education problems growing out of this broadened concept. This policy is not felt to be inconsistent with that followed in earlier reviews. Martin, in the June 1947 issue of the REVIEW, considered research in agricultural education *in toto* and gave attention to investigations that cut across the usual dividing lines of responsibilities between agencies. This emphasis has been continued by reviewing current research in the light of a broader concept of agricultural education.

Previous summaries in agricultural education have included a total of 1041 studies. The latest publication (2) reviewed those completed thru 1947. A subsequent summary covering research projects from 1947 thru 1950, and bringing the total number of papers reviewed to 1187, is now in manuscript form. A majority of all of the studies to date have been in the specific area of vocational education in agriculture.

Increasing interest and productivity in research have been noted. In the June 1947 issue of the REVIEW, Martin considered 125 studies in the preparation of his material. Three-hundred fifty have been consulted in the preparation of the current chapter.

Some Shortcomings in Presentday Research

In spite of the growing regard for research and the attendant increase in its productivity, research in agricultural education still has obvious shortcomings. Deyoe (13, 14) pointed out a persisting tendency of investigators to overuse a few technics at the expense of others perhaps equally desirable. He also emphasized (a) that most studies have been of short duration, (b) that relatively few have been made by trained research specialists, (c) that even these do not appear to be well distributed over the entire field of agricultural education, and (d) that workers in the field have not made enough use of the results obtained. Doubtless these criticisms were true. However, progress in overcoming them has been evident. The summaries of studies prepared by the American Vocational Association (2) still indicated a preponderance of those dealing with courses of study and curriculum and with the procedures and materials of teaching. At the same time, a significant increase was also noted in studies in fields hitherto relatively neglected.

Lessons from the Educational Program for Veterans

The most significant growth in number of studies was found in the area centering around institutional-on-farm training for veterans. Hamlin (21), as chairman of a national conference for planning and implementing a nationwide study, suggested a long-range investigation to find the implications for future programs in agricultural education existing in the patterns followed in this new adult education program. Kitts (31) studied the occupational and educational readjustment of rural veterans and concluded that a number of adjustments and improvements were needed in educational facilities for rural youth. These included adjustments in the curriculum, in community activities, in utilizing local leadership, and in improved guidance and placement programs. Three studies (18, 27, 42) dealing with the general aspects of institutional-on-farm training programs described individual training programs and summarized their development in the immediate postwar period. Other studies (35, 38, 40, 48) investigated the need for instruction by veterans, compared the effectiveness of different types of instruction used in their classes, and outlined areas of participation in their experiments with improved practices.

The role of the county schools in providing instruction for veterans was studied by Walton (56). Achievement tests of individuals enrolled in such classes were used by Wiegers (59) to evaluate the outcomes of instruction in institutional-on-farm courses. Another study (57) appraised the veterans' training program in terms of its accomplishments for Negro veterans.

In sponsoring a nationwide study—as recommended by the agricultural section of its research committee—the American Vocational Association (1) recognized the importance of coordinating and implementing investi-

gations in this field. The procedures and values growing out of such a program, they urged, should not be lost in the rush of a relatively short-term action program. Kitts (32) pointed out the importance of research in this area and presented strong evidence for the need for shifting emphasis in the entire program of vocational education in agriculture from that of the all-day school to that for out-of-school youth. In arriving at his conclusions he analyzed the occupations, attitudes, and employment desires of a significantly large group of veterans.

The National Conference on Research Related to Future Programs of Agricultural Education (21) emphasized the importance of studies in two general areas of the regular public-school programs. It proposed and recommended investigations dealing with evaluations of teacher activities and teacher loads and with studies to determine the probable future demands for agricultural education in the public schools.

Teacher Load and Responsibilities

In spite of its importance, relatively few studies dealt with the increasing load of duties and responsibilities of teachers of vocational agriculture. Hill (24) studied the time allotted to professional activities of teachers and concluded that either additional teaching personnel must be provided in most departments or that a careful evaluation be made of present and contemplated activities. He also concluded that supervision of farming programs of students was the activity most likely to suffer from the addition of other duties. Phipps (45) examined the trends in supervised farming over the past two decades and pointed out the importance of home visits and supervision in the effectiveness of this activity. Other investigations (12, 46, 58) analyzed and listed teacher activities, indicated those needing special emphasis, and outlined success determinants in the work of teachers. Hays (23) reported upon the activities and programs that should be provided by secondary schools in rural areas.

In contrast to the small amount of research on teacher activities, a number of significant studies have been made in the general area of program evaluation, planning, and probable future demands for agricultural education. Hamlin (22) outlined procedures for using local advisory councils effectively in evaluating local programs and aiding in program planning. Loreen (36) made a comprehensive study of an area in the Pacific Northwest, now being developed as a result of an extensive irrigation and reclamation project, to determine its needs in agricultural education. Starrak and McClelland (49) investigated the need for expanding vocational education in agriculture as a basis for statewide program planning. They found that vocational education on the secondary level has been reaching a relatively small proportion of the farming population and that lack of qualified teachers and limited funds for support were major factors in inhibiting growth. As a partial remedy, they advocated regional schools offering post-high-school education as

well as integration of extension and public-school programs. Theodorau (52), as a part of a long-time study, gathered data on the occupational establishment of former pupils of vocational agriculture. He emphasized the importance (a) of guidance and selection of pupils, (b) of training for occupations related to farming, (c) of improvement in guidance programs, and (d) of continuing education for out-of-school youth and adults. The publication of the nationwide study of the U. S. Office of Education (55), involving an evaluation of local programs in vocational agriculture, made an effective contribution in terms of criteria to be used in planning programs.

Expansion in Teacher-Training Programs

During the past triennium, teacher training and teacher education generally have experienced rapid expansion and growth. Teacher shortages in the immediate postwar period were acute, and most teacher-training institutions were concerned with providing more effective training for their candidates. It is not surprising, therefore, that research in this field received an impetus. College preparation of teachers of vocational agriculture was the subject of three investigations (3, 4, 10). Much attention was given to the improvement of programs of directed teaching. Kirkland (30) investigated directed teaching in the southern states and recommended a more comprehensive study of this problem on a regional basis. He emphasized the importance of selecting training centers that provided special training for supervising teachers and of improving the quality and extent of participating experiences acquired by trainees. Phipps (44) considered the possibility of internships for trainees in vocational agriculture. For the purpose of making preemployment training programs more functional and changing emphasis in the light of the actual problems met by teachers in the field, Kirkland (29) studied the difficulties faced by teachers during the first year of teaching vocational agriculture. Including both technical and professional problems in his investigation, he found the difficulties reported by the highest percentage of teachers to be (a) inability to perform activities in the areas of program planning, (b) the all-day program, (c) the adult farmer program, and (d) maintenance of physical plants and facilities. Godfrey (19) confined his observations to the professional difficulties of beginning and experienced teachers. Parker (43) reported implications of these problems to the relative emphasis that should be given to the content of teacher-training programs. Procedures for a program of directed student teaching were suggested by Bjoraker (7).

Teacher-training institutions are concerned with the placement of their graduates. Hall (20) analyzed vocations pursued by graduates in agricultural education. Sutherland and LeCount (51) surveyed all graduates over a fifteen-year period to determine occupational distribution and changes in occupation. They also compiled recommendations made by

former students as to desirable curriculum changes. Occupational experience in farming has long been a requisite for teacher candidates. Shoptaw's investigation (47) of the farming abilities of teachers to determine implications for training programs stressed the importance of the college period for the successful development of judgment skills.

The field of education for out-of-school youth, other than that of the education of veterans thru institutional-on-farm training, received relatively little attention. In anticipation of the decrease in emphasis on the training of veterans, Bender (5) developed a problem checklist and demonstrated its use in planning programs for rural farm youth, particularly young farmer groups. Fife (16), studying the effectiveness of selected organizations of young farmers, made an analysis of objectives, procedures, and practices affecting the development of these groups.

A New Problem from Suburban Part-Time Farming

As evidence of the acceptance of a broader concept of agricultural education, an increase was noted in investigations in other than strictly vocational areas. It has evidently become necessary to consider the needs of nonvocational and prevocational pupils in over-all plans in agricultural education, as well as of those enrolled in terminal courses at the post-high-school level. With the increasing number of part-time farmers, especially in the suburban areas, a special problem has arisen in vocational agriculture. It involves the responsibility of the schools in serving both youth and adults from this particular type of farm (8). Knight (33) and Huddleston (25) have investigated current practices in solving this problem, and Bruce (9) has developed a course of study (in vocational agriculture) for prospective part-time farmers. In prevocational agriculture, the University of the State of New York (41) outlined the organization, aims, functions, and content of courses for junior-high-school pupils. Strong (50) investigating federally aided programs in agriculture at the junior-college level, summarized educational developments in this phase of terminal education.

Adult Education for Young Negro Farmers

In the field of agricultural education for Negroes, most attention was directed to the areas of adult education and instruction in land-grant colleges. Investigations included an analysis of the occupational distribution of former students of vocational agriculture (26) and of adult education programs for young Negro farmers (28). Evaluations were made of institutional-on-farm training for Negro veterans of World War II (57) and of the technical agricultural instruction offered in Negro land-grant colleges (39).

Inservice Training and Supervision

Developments in the field of teacher education included growing concern with problems of inservice training and supervision. To find a basis for more effective supervision, Duck (15) studied devices for objective measurements of departments. He selected fourteen factors that could be measured mathematically and concluded that for inservice training more use might profitably be made of objective evaluation. Young (60) stated that if we accept the concept of education as a life-long process, then inservice education becomes imperative. He outlined procedures most commonly followed by state and district supervisors. More emphasis, he recommended, should be given to a democratic procedure, in which supervising teachers become a part of a policy-forming group. He urged more consideration for upgrading and inservice education than for inspection and handling of emergency problems. Decker and Brunner (11) formulated criteria for evaluating programs in the area of supervision.

In spite of the importance of the Future Farmer organization as a device in all-day instruction and of its significance as a factor in education for citizenship, only three studies were noted in this field. Fife and Weiler (17) studied training programs for state and local officers of this organization. Leonard (34) investigated and listed cooperative activities of local chapters. Timmons (53) made an occupational follow-up of former degree recipients to determine to what extent they have followed occupations for which they were prepared.

A noteworthy example of interagency planning was provided by the U. S. Department of Agriculture and the Association of Land-Grant Colleges and Universities (54). Their joint committee report on extension programs, policies, and goals illustrated the necessity and the feasibility of utilizing all available resources and viewpoints in formulating major educational programs.

Evaluation of Audio-Visual Aids in Agricultural Education

An interesting basic research study of certain audio-visual aids was made by Bentley (6). He investigated the relative effectiveness of these aids in informational learning and in increasing the ability to solve problems and to apply principles in vocational agriculture. He also observed the effectiveness of audio-visual aids on retention. He concluded that their value in informational learning was significant but was unimportant in problem-solving ability and retention.

Using the Results of Research in Agricultural Education

This chapter has presented a review of many worthwhile and significant studies. There remains, however, the problem of channeling the findings of such research so that they do not become merely an end in themselves but do develop into useful and effective practical aids in better agricultural education. Deyoe (14) stressed this approach by emphasizing the

importance of selecting, for research, problems that are important and timely, of providing popularized interpretations for each significant study completed, of giving increased attention to research conferences and workshops, of encouraging teachers to use the results of research, of developing pilot centers in which research findings are applied and refined, and, finally, of using the digests, reviews, and summaries of the completed studies.

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Index to Volume XX, No. 4

Page citations are made to single pages; these are often the beginning of a chapter, section, or running discussion dealing with the topic.

- Adjustment, 277, 304
Adult education, 334
Agricultural education, 330; for adults, 334; audio-visual aids, 335; curriculum, 332; inservice training, 335; teacher training, 333; teaching load, 332; for veterans, 331
Attitudes, 266, 279, 304
Audio-visual aids, 265, 335
- Business education, 322; accounting, 324; bookkeeping, 324; clerical occupations, 326; distributive occupations, 326; general business training, 325; shorthand, 322; trends in, 322; typewriting, 323
- Camping education, 287
Citizenship education, 257, 266
Commercial education, 322
Community resources, 259
Conservation education, 259
Consumer education, 259
Contemporary affairs, 260
Critical thinking, teaching of, 262
Current events, 260
Curriculum, social studies, 257
- Democracy, education for, 263
Driver education, 311
- Economics, 258
Extracurriculum activities, 295
- Family-life education, 299; curriculum, 300; methods, 300; needed research, 306; teacher training, 305
- Geography, 259
Group discussion technics, 264
Group dynamics, 265
- Home-economics, 300; tests, 302
Human relations, 274
- Industrial arts education, 309; aptitude tests, 313; curriculum, 310; history of, 311; methods, 310; shop planning, 312; teacher education, 309
Industrial education, 309, 317
Inservice training, 335
Institutional training, 287
- Intercultural education, 274; development of, 274; methods, 277; needed research in, 281; research methods, 281
- Interests, reading, 295; recreational, 296
- Leadership, 267
- Leisure, education for, 294; in college, 296; in elementary school, 294; needed research, 297; in secondary school, 294
- Morale, of teachers, 306
- Prejudice, 274
- Public relations, 312
- Pupil-teacher planning, 264, 301
- Reading, in social studies, 264
- Recreation personnel, 296
- Social class, 275
Social education, 257
Social studies, 257; audio-visual aids, 265; citizenship education, 266; community resources in, 259; conservation education, 259; consumer education, 259; contemporary affairs, 260; course offerings, 258; curricular organization, 261; curriculum, 257; economics, 258; geography, 259; history of, 257; neglected areas, 260; teaching critical thinking, 262; teaching democracy, 263; tests, 266; textbooks, 261
- Sociometry, 265, 305
- Teacher morale, 306
Teacher-pupil planning, 264, 301
- Teaching load, 332
- Technical education, 315
- Tests, home economics, 302; social studies, 266
- Textbooks, social studies, 261
- Vocational education, 287, 309, 314; apprenticeship training, 315; curriculum, 316; in college, 288; in school camps, 287; materials, 314; technical education, 315
- Work education, 287
- Work-experience programs, 287; in college, 288; in corrective institutions, 287; needed research, 291; organization of, 288; outcomes, 289; present status, 290; in school camps, 287



FOREWORD

THIS number of the REVIEW is the seventh in the series dealing with growth and development. The current number shows a continuation of the trends first noted about a decade ago; namely (1) an increased interest in research pertaining to the personal, social, and physiological aspects of development, and (2) a declining interest in research pertaining to mental and motor development.

The triennium covered by this number of the growth and development series may be characterized by (1) prolific writing, especially in the area of personal, social, and physiological aspects of development, but with no startling positive results; (2) an increasing interest in changes which take place in later life; (3) the absence of basically new tools, new techniques, new methods of analysis and procedure—with but few exceptions, the studies reported in this number of the REVIEW are repetitions of, or elaborations upon, similar studies reported earlier; and (4) a wide variation in the quality of research reported—unfortunately, the outstandingly good pieces of research are not numerous.

In line with policies established by previous committees on Growth and Development, the current number has excluded numerous studies dealing with specific manual skills where there is no consideration of changes with age. With the exception of a few in which there is a definite contribution to an understanding of the normal aging processes, studies involving clinical cases, in general, have not been included.

GUSTAV J. FROEHLICH, *Chairman*
Committee on Growth and Development



CHAPTER I

Mental Development from Birth to Preadolescence

DEAN A. WORCESTER

Introduction

THE number of significant investigations available for review in the area covered by this chapter is somewhat less than that reported in previous reviews. Moreover, it appears that in the last three years there have not been any markedly new lines of research on the intellectual development during infancy and childhood. Almost all of the studies examined would fall into classifications similar to those used in earlier reviews. During the period of this review the effects of culture, schooling, or drugs on intelligence were still under investigation and controversies on these points were still active. If there was a change of emphasis in research, it was perhaps in the direction of determining the effects of physical conditions upon development, and in discovering the ways in which individuals of differing mental abilities respond to certain situations.

The quality of research reported was variable. New tools and refined statistical technics were employed in many quarters, but in the opinion of the writer, questionable procedures were still too much in evidence.

Tests and Testing

A few new tests of mental development have appeared during the period of this review, and a number of studies have been made involving special applications of existing measures. Several volumes describing tests, testing procedures, and principles underlying testing have appeared in this period. Among these were those of Buros (12), Cronbach (13), Freeman (17), Goodenough (20), Mursell (34), and Sarason (35).

Use of a new type of test, the *Full Range Picture Vocabulary Test*, was reported by Ammons, Arnold, and Herrman (2) and by Ammons and Holmes (3). This test covering preschool to adult levels presents a series of plates to which the individual tested responds by indicating the picture which illustrates a given word. Since the indication can be given by any means possessed by the subject tested, it is suggested for use with the cerebral palsied. Tracht (40) demonstrated the possibility of the use of the *Progressive Matrices* with the cerebral palsied. Gilliland (19) gave detailed evidence of the validity of the *Northwestern Infant Intelligence Test*, and held that infant tests may be more predictive than some earlier work has indicated. Escalona (16) compared *Gesell Development Schedule* and *Cattell Infant Intelligence Scale* data with retests on Cattell and

Stanford-Binet. He suggested that infant tests of this type have greater value when integrated with other clinical procedures.

Wechsler (41) discussed the nature of mental development and in the light of his hypotheses brought forth the *Wechsler Intelligence Scale for Children* which, like his adult test, has both a verbal and a performance scale.

Caution against inadequate diagnosis of retarded mental development was sounded by many. Jastak (27) stated that an individual should be classified as feeble-minded only if he fails to surpass the second and third percentile on *any* of several tests representing many functions. Arthur (4) recommended that those individuals whose test ratings have been depressed by special handicap be given training before a diagnosis is made.

Differences Among Children in Terms of Developmental Levels

Several studies have been made to discover differences among children of different stages of mental development—quantitative and qualitative. Baldwin (7) found that some Stanford-Binet items are not of the same difficulty for high and low IQ groups—the more realistic items being easier for those of lower IQ's. Cruickshank (14, 15) demonstrated that mentally retarded children solve problems in different and less adequate ways than do normal children of the same M A's. Brace (10) discovered only a slight relationship in motor learning of feeble-minded girls as compared with normal girls.

Hunter and Bartlett (23) studied a group aged two to seven and found no child under three years and seven months able to solve the double alternation problem. From this age upwards correct responses can be extended beyond the length of the training series. Below five years, children do not verbalize the problem even if it has been mastered.

In a study of the development of space concepts, Ames and Learned (1) concluded that the child is usually able (a) to respond to a space word, then (b) to use it spontaneously, and finally (c) to use it to answer a question. Irwin (24, 26) presented evidence that the production of phonemic frequencies increases at a constant rate during the first one and one-half years of life and thereafter increases at an accelerating rate.

Effects of Physical Handicaps

Avery (6) found that aurally handicapped children are not inferior in intelligence, motor skills, or mechanical ability; but he also found that they do exhibit more emotional maladjustment. Hood (22) also found the deaf to be of normal intelligence. However, he concluded that more of those born deaf are of retarded intelligence than is true of those who are adventitiously deaf. Intelligence increases with attendance at a school for the deaf.

According to Knehr and Sobol (30) there was no significant deviation

from the average in intelligence at six years of age of those who had been prematurely born. Asher and Roberts (5), in a study of 4800 school children, found no difference in mean birth weight between the 20 percent of highest intelligence and the remainder. That whooping cough in early infancy may lead to severe intellectual deterioration was shown by Levy and Perry (31). Meyers (32) indicated that poliomyelitis, especially when contracted at an early age, tends to interfere with mental development. Among the cerebral palsied, Burgemeister and Blum (11) reported that the whole range of intelligence is represented, although there is a disproportionate number of mental defectives among those individuals showing rigidity.

Effects of Culture

Considerable research was reported on the effects of culture upon special abilities and upon the IQ. Irwin (25) found negligible effect of the presence of sibs in the family on sound development in infants; but Kalhorn (29) discovered that there are significant differences in performance of sibs on Stanford-Binet items. Older sibs tended to excel on rather abstract items, but younger ones succeeded on a larger number of items and, therefore, tended to have higher IQ's.

As to word fluency, Moore (33) compared the speech content of orphanage and nonorphanage children in an age range of 32 to 64 months. With chronological age and mental age constant, differences were found in favor of the nonorphanage children. Gewirtz (18) reported that the word fluency of preschool children whose parents were mostly in the professions had higher relationship with chronological age than with mental age.

Jessner (28) displayed case studies to illustrate that permissiveness in the treatment of children is favorable to mental maturity.

Baldwin (8) accounted for part of the variability in Standford-Binet IQ in children, ages three and one-half to 15, as being due to inaccurate adjustments at the younger and older age levels. Bayley (9), studying individual curves, found that a child's intelligence is more stable from test to test when described in standard scores than would appear from IQ's, and that the course of intellectual growth in each child is unique. Tests and periodic retests of 252 children from 21 months to 18 years by Honzik, MacFarlane, and Allen (21) indicated that IQ constancy is markedly dependent upon age. Changes of 15 points or more in IQ occurred in 60 percent of the cases, some changes being very large. The direction of change tended toward the family level.

Skeels and Harms (37) presented an investigation which showed that children whose mothers had low IQ's and whose fathers were of low occupational status, or both, and who were committed to an orphanage at less than six months of age and adopted by two years, attained mental levels equal to or exceeding that of the generality. Moreover, superior

intelligence appeared at a somewhat greater frequency than would be expected from a random sample. Skodak and Skeels (38), in a follow-up of 100 children from inferior backgrounds who were placed in adoptive homes, found not only that the intellectual level was consistently higher than what would have been expected from the parentage, but also that it was higher than that of own children in the socio-economic level in which they were reared. These studies which almost imply an advantage in being born in inferior circumstances will undoubtedly continue to encounter resistance in the emotions if not in the minds of many. Perhaps a clue to the answer may be found in Spitz's (39) experience. He reported that among 91 foundling-home children having no mother contact, 37 died during the first two years, and "with one or two exceptions those who survived behaved in the manner of agitated or apathetic idiots." Spitz's report was not without inaccuracies. Unquestionably it would be helpful to know whether or not the foundling homes studied by Spitz were typical. In all of these studies, obviously, the cause of low IQ's in parents should be known. Notwithstanding the extreme nature of the above report of Spitz, if the general hypothesis of the necessity of mother contact for normal mental development be true, it may, indeed, suggest an explanation for such findings as those reported by Skodak and Skeels. Those persons who adopt children may give them more affection and attention than do average parents, which may produce in turn the results indicated. Sawyer (36) reported a case of a child born to a mongoloid mother with an IQ of 25. This child was adopted at the age of two years. At age 11 he had an IQ well above average and had earned high marks thru the fifth grade of the elementary school.

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CHAPTER II

Mental Development During the Preadolescent and Adolescent Periods

GORDON HENDRICKSON

Summaries and General Treatments

SECEL (57) prepared a well-organized monograph on the development of intellectual abilities in the adolescent period. He based his discussion on a wide variety of sources as well as on some new data. Other surveys of the research literature may be found in the revised *Encyclopedia of Educational Research* (42), and in articles by Jones and Bayley (33), and Thorndike (68). Textbooks on child or adolescent psychology by Averill (3), Breckenridge and Vincent (10), Cole (14), Cole and Morgan (15), Hurlock (30), and Olson (46) included sections on mental development. Olson drew many inferences for school practice from the research literature of the period.

Anderson (2) proposed a classification for literature pertinent to child development. Gesell and Ilg (25) combined their earlier works on infant and child development, stressing characteristics of successive age levels up to age 10. Jenkins, Shacter, and Bauer (31) prepared a popular treatment of the characteristics of children at each age from five to 11, and Schnell (55) wrote a digest on psychological characteristics of youth at four age levels from 10 to 21. In a pamphlet addressed to adolescents, Bouthilet and Bryne (9) discussed the factors in general intelligence and provided a helpful orientation for prospective test-takers.

The Organization of Intellectual Powers

Theoretical discussions as well as research on the organization of intellect have revolved around the problems of traits or factors. Burt (12) argued that the evidence points to a hierarchy of a general factor and a small number of broad group factors, subdivided into narrower group factors; i.e., to factors arranged by levels. To the primary group abilities recognized by Thurstone, Burt (11) would add a general factor. Anastasi (1) regarded traits as results of learning and, due to the greater cultural standardization of intellectual activities, considered traits as more consistent and easier to identify in the intellectual aspects of behavior than in the emotional aspects.

New tests produced in this period were chiefly analytical in character and generally yielded several scores. Notable are the *SRA Primary Mental Abilities tests (PMA)* by the Thurstones (69, 70), appropriate for subjects

from the junior high school thru the college level, and a set of seven differential aptitude tests by Bennett, Seashore, and Wesman (5).

Adolescent Intellectual Abilities

A number of studies attempted to isolate specific adolescent intellectual traits or dealt with their relationships. Johnson (32) studied problem-solving abilities in arithmetic at the eighth-grade level. Of the *PMA* tests, the vocabulary test gave the highest correlation with arithmetic problem tests. The flow of words in writing was studied by Taylor (66). Taylor analyzed fluency for high-school seniors into two factors: word fluency, i.e., facility in producing single, isolated words; and ideational fluency, facility in expressing ideas by means of words and their meanings. Murray (44) employed a multiple correlation procedure to analyze the geometric ability of high-school boys. He found spatial ability, as measured by the *Minnesota Paper Form Board*, and reasoning, as measured by the *PMA* tests, contributed less to success in geometry than numerical or verbal ability, as measured by the *Modified Alpha Examination*.

Fattu and Fox (24) found the ability of ninth-grade pupils to interpret data to be closely associated with factors which make up typical group measures of intelligence and achievement.

A unique approach to traits is found in two French studies by Michaud (38, 39). He was concerned with the interpretation which pupils give to geometric figures, and asked children aged nine to 14 to interpret the thickness of squares drawn on a blackboard or on paper. He found the percentage of realistic responses to diminish, and the percentage of rational responses to increase with age. Realistic responses, wherein subjects aged 10 to 15 were asked what would happen if a triangle which they imagined drawn on the ground were superimposed upon another imagined triangle, were also more characteristic of younger children in the second study.

Factor Analysis Studies

The most frequent procedure in attacking the problem of intellectual organization continued to be that of factor analysis. This procedure has been used to study changes with age, the relative importance of various factors for prediction, and other issues. In a group of studies, Swineford (62, 63, 65) reported the results of test batteries administered to pupils in Grades V to X and repeated at various intervals. Six tests were given to pupils in Grades VII or VIII and repeated when the pupils were in Grade IX. After one or two years factor analysis revealed no material change in the factor composition of the tests. The general factor apparently increased both in its absolute and in its relative contribution to the total test variance. For a group of pupils who took nine tests in the sixth grade and again in the ninth grade, three bi-factors persisted as entities but

grew at different rates; the general factor most, the verbal factor to some degree, the spatial factor not at all. The means for the general factor increased repeatedly and steadily with school grade level from Grade V to X. The means for the verbal factor increased gradually and irregularly. Retarded pupils were markedly inferior in the general factor, less so in the verbal factor, and equivalent to the normal group in the spatial factor. According to Swineford the general factor is the only one which predicted school marks with any consistency. Another report by Swineford (64) dealt with a number factor revealed by data from 19 tests given to ninth-grade pupils. This factor may be related to the pupil's mental set in approaching a task, a set determined by his liking or dislike for numbers. Swineford also inferred from the data that girls are more affectively sensitive to numbers than boys.

Curtis (16) also presented data emphasizing the importance of a general factor. His data on nine- and 12-year-olds failed to support Garrett's hypothesis that "abstract or symbol intelligence changes in its organization as age increases from a fairly unified and general ability to a loosely organized group of abilities or factors." On the other hand, Segal (57) accepted Garrett's conclusion and presented new data to show that differentiation among traits is more pronounced for bright ninth-grade pupils than for dull ones. Diamond (21) used a factor analysis procedure which he believed showed that the Wechsler-Bellevue subtests may serve as indicators of linguistic, clerical, and spatial aptitudes.

Development in Specific Traits

A number of investigators compared subjects at various ages by measures which were designed to reveal growth in particular traits. Webber and Hunnicutt (74) studied improvement in the ability to perceive change of color in painting with subjects from Grades I thru IX. Birch (6) found the Goodenough drawing test valuable in studying the processes of concept formation in a group of borderline or mentally defective children aged 10 to 16 years.

Three investigators were interested in moral traits. Turner (71) developed a scale of altruism and found no improvement from age nine to age 16. Beller (4) studied the attitudes toward honesty of boys aged nine, 12, and 15 years. On the basis of verbal problems, Dowd (22) studied moral reasoning in Catholic girls from Grades VIII to XII.

Hilden (27) reported a study of 100 children from birth, 30 of whom had taken several mental tests by the age of 16. The mean IQ of the subjects was 119 with a range of differences between repeated tests from seven to 64 points. On the average there was a slow and reliable rise in score not accounted for by practice effects. Hilden suggested that the highest IQ score prior to puberty might be more representative of mid-adolescent status than scores on the early test. Another retest study by Kvaraceus and Lanigan (36) reporting data on the *Iowa Every-Pupil Tests*

of Basic Skills administered at half-year intervals in the junior high school, indicated that individual performance at any one testing period should be interpreted with discretion; in some cases scores drop for a test period. A European study presented results from tests of subjects of various age levels. Vernon (72) found general intelligence increasing more rapidly and to a later age among boys who continue in school to the age of 17 and beyond, and among men in "intellectual" occupations. In general, Vernon concluded that abilities depend largely on the extent to which they are used.

Gains in Intelligence During College Years

Retests of students on the *American Council on Educational Psychological Examination* were reported from several colleges. In general, the investigators concluded that gains over and above practice effects do occur. Thorndike (67) found such gains occurring to the age of 20 and probably beyond. Projections of the growth curve for his data indicated either age 21 years, six months or 25 years, nine months as a point of zero gain, depending upon the mathematical treatment of the data. Shuey (59) found gains for college students.

Prediction of Academic Success

Studies on prediction of academic success in high school and college ranged from those which employed simple correlations of test scores and grades to multiple correlation and factor analysis studies. Shaw (58) used multiple correlation and Beta coefficients in treating data from the *PMA* tests and 13 measures of achievement for 591 high-school students. He found verbal-meaning to be highly related to every achievement measured, with reasoning in second place but not closely so. Little power to predict achievement was found for number, word fluency, space, and memory scores. A study evaluating several tests for prediction of high-school achievement was reported by Bolton (7).

At the college level Remmers, Elliott, and Gage (48) found certain tests developed at Purdue (*Placement Test in English, Mathematics Training Test, Physical Science Test*) more predictive of grade point averages of freshmen than scores on the *American Council on Education Psychological Examination*. Lanigan (37) found that the *ACE* differentiated better between high-achieving and low-achieving college students than the Otis test or the *Minnesota Speed of Reading Tests*. At the University of Wisconsin, Milligan, Lins, and Little (40) also found the *ACE* especially useful for identifying students at the upper and lower ends of the distribution of intelligence. They reported the *ACE* helpful in predicting achievement for nonhigh-school graduates admitted to the university.

Borg (8) reported low positive correlations between the *ACE* and success in a college of arts and crafts.

Investigators using the *ACE* repeatedly on the same group were warned by Muntyan (43) that the norms for a first testing cannot be justifiably used in interpreting the results of a retest.

Miscellaneous Relationships of Intellectual Abilities

Kendall (34) reported that there was no significant relationship of scores on a memory-for-design test with retardation in reading for a group of children aged six to 16. Hobson (29) gave *PMA* tests in Grades VIII and IX. Significant sex differences were found. Boys were superior in spatial orientation, and girls excelled in word fluency, inductive reasoning, and visual memory. Wheeler and Wheeler (75) inferred from correlations between *ACE* and reading test scores of university freshmen that *ACE* performance is highly influenced by reading skill. A Dutch version of the *National Intelligence Test* was used by de Groot (20) to study the effects of war upon the intelligence of youth. His 13- and 14-year-old subjects averaged four IQ points lower than similar subjects tested in prewar years.

Intellect in Relation to Social Factors

Davis and Havighurst (19) prepared a general report on cultural factors claimed to produce differential test results in various socio-economic groups. These writers continued to present evidence on this problem as well as general discussions of their theoretical position (18). Schulman and Havighurst (56) found a correlation of .46 between vocabulary size and socio-economic status for children in Grades IX and X in a midwestern community. Durea (23) presented some evidence indicating that the mental retardation of delinquent boys aged 11 to 18 may be a reflection of the sub-par socio-economic conditions from which the delinquents come.

Intellectual Growth of Feeble-minded Children

By the publication of claims that feeble-minded children had been made normal thru education, Schmidt (52, 53) precipitated one of the most violent psychological controversies of recent years. Popular articles on Schmidt's work by Stern (61) and Clark (13) challenged long-settled beliefs concerning the improvement of the mentally deficient. Schmidt reported an eight-year study of 322 school children, aged 12 to 14, ranging in IQ from 27 to 69, including experimental and control groups. For three years the experimental subjects were taught in a school environment planned to decrease nervous tensions, to remove emotional blocks, to further social interaction, and to develop self-confidence and a sense of personal worth. Regular school subjects plus hand work were taught at a slower rate than normal to a control group. A five-year follow-up permitted study of out-of-school or later school adjustment of

these individuals. The results for the experimental group included (a) gains in social adjustment and maturity and in Bernreuter scores, (b) the completion of a four-year high-school course by 27 percent of the group, (c) a good employment record for children out of school, and (d) an increase in IQ from an initial mean of 52.1 to 71.6 after three years of training and to 89.3 after the five-year follow-up.

Kirk (35) reviewed Schmidt's study in the light of an investigation of pertinent data in board of education records in Chicago, where Schmidt was a teacher. Kirk raised questions concerning: (a) the correspondence of the initial IQ distributions for the subjects with the statistics for Chicago special classes as a whole; (b) the appropriateness of the Bernreuter test for pupils of the mental status of the subjects; (c) certain statistical anomalies in the presentation of the data; and (d) the professional status of Schmidt at the time of the study. Schmidt (54) replied in general terms stressing scientific method, similar results reported by other investigators, and professional ethics. A survey by Nolan (45) revealed considerable doubt of the validity of the results on the part of several well-known psychologists.

Other evidence on intellectual changes in mental defectives is conflicting. Rudolf (49) reported that on the Wechsler-Bellevue verbal scale and on the *Vineland Social Maturity Scale* 395 defectives showed more rises than declines on retests six months or more after initial tests. The inference was drawn that defectives should be given continued education after the age of 16. Guerlin (26) reported on the mental growth curve of 25 institutionalized defectives whose IQ scores showed marked increase over a period of time in comparison with the IQ performance of 25 controls who failed to show improvement.

A report by Hill (28) on retests of 107 special-class children in Des Moines showed occasional significant changes in IQ, possibly due to the social environment, but there were no consistent gains such as those reported by Schmidt. Sloan and Harman (60) studied 1446 institutionalized mental defectives, for whom the median chronological age at initial testing was 14.4, at final testing, 17.6; the corresponding median IQ's were 51.9 and 47.4. Cutts and Lane (17) reported that 57 defectives who had been hospitalized for seven years received lower scores on the Wechsler-Bellevue verbal scale than 57 defectives hospitalized for one year.

Two studies dealt with educational programs for adolescent special-class pupils. Mones (41) discussed 10 years of experience in Newark, New Jersey, where a specially adapted program at the junior-high-school level proved profitable to special-class children.

Chemical Regulators of Intellectual Growth

Glutamic acid has been claimed by several investigators to stimulate intellectual growth on the part of mental defectives. Waelsch (73) re-

viewed 23 references on this subject. Zimmerman, Burgemeister, and Putnam (77) reported on a series of clinical cases, ranging from infancy to adolescence, and concluded that glutamic acid accelerates mental functioning in human beings, chiefly in the first six months of treatment. A ceiling of improvement is apparently reached after one year of therapy. Zimmerman (76) suggested a definite dosage and claimed that the treatment had value for children in the 70 to 80 IQ range. Quinn and Durling (47) reported small gains (three to five IQ points) for institutionalized defectives treated with glutamic acid for six months. Rudolf (50, 51) investigated the value of thiamine treatment. Out of 90 defectives who had not improved for over a year, all of whom were treated with thiamine, 17 showed some increase in IQ, and 20 showed an increase in social age.

Unsettled Issues

Few issues in this field can be regarded as closed, but a list of a few unsolved problems in which there is current interest may be helpful. Several of the following research areas were suggested by Segel's review (57): (a) The existence or significance of a general factor in intellect; (b) Increase of differentiation among traits with age; (c) Relative variation of traits within the individual and within groups; (d) Stability of the mental growth of individuals; (e) Independence of time cycles for growth of various traits; (f) Existence of definite interest areas in early adolescence and their relationship to intelligence; and (g) Relationship of intellectual traits and level to socio-economic factors.

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CHAPTER III

Intellectual Changes During Maturity and Old Age

HERMAN D. BEHRENS and ROYAL F. NESTER

Introduction

Most of the research published since the last review of this topic in 1947 deals with (a) tests of adult intelligence, (b) factors affecting intellectual change, and (c) the intellectual changes which take place during maturity and old age. Many of the investigations relate specifically to changes in psychosis. The authors will follow the policy set in previous reviews of this topic by citing studies involving clinical cases only when they contribute to an understanding of the normal aging processes. Therefore, the amount of actual research in this field is limited. In many of the areas, the data are conflicting, which makes it extremely difficult to draw valid conclusions. For the most part the trend during the last three years was toward the study of physical and intellectual changes of normal people during old age. Many of the investigators seem to have analyzed their data very critically in an effort to determine the effect of the part scores of intelligence tests on the total score. Furthermore, they have studied the qualitative aspect of intelligence with special reference to the factors affecting intelligence, such as years of schooling, occupation, and the socio-economic background of the test group.

Tests of Adult Intelligence

The two most widely used scales for measuring adult intelligence were the *Wechsler-Bellevue Adult Intelligence Scale* and the *Shipley-Hartford Retreat Scale*. Both of these instruments were criticized as measures of mental status. Garfield (12) used the scores of 126 men who tested below a mental age of 11 on the Shipley-Hartford scale and compared them with scores made by the same men on the Wechsler-Bellevue scale. He found the scores of the Shipley-Hartford scale comparatively lower than the scores obtained by the same group on the Wechsler-Bellevue scale. Garfield concluded that the mental age secured from the Shipley-Hartford scale cannot be interpreted as a valid mental age, particularly for individuals in the lower half of the intelligence distribution. Garfield and Fey (13) made a comparison of the Wechsler-Bellevue and the Shipley-Hartford scales as measures of mental impairment. They found a correlation of .13 between the *Wechsler-Bellevue Indices of Impairment* corrected for age and the *Shipley-Hartford Conceptual Quotient*. Their study also showed a decided drop in score on the Shipley-Hartford scale with increase

in age, whereas the opposite was true with the corrected Wechsler-Bellevue index. Kass (17) reported that *Wechsler's Mental Deterioration Index* (the ratio of tests that do not hold up with age to those that do) failed to detect and confirm the presence of organic conditions resulting largely from traumatic brain injury. Hunt (15) analyzed the mean and standard deviation of subtest scores for different age groups from Wechsler's data and concluded that only two of the "Hold" tests, Information and Comprehension, functioned well with increasing age groups. Block Design and Digit Symbol are the only two "Don't Hold" tests that showed gradual and consistent age decline with respect to Information and Comprehension. Boehm (2) concluded from a study of 22 familial defectives, aged 15 to 61, that Wechsler's Deterioration Index could not be trusted to distinguish mental loss from mental deficiency. In an attempt to determine the validity of some abbreviated scales, Kushner (18) tested 131 subjects at age 14 years with the *Arith-Re Intelligence Test* and retested at age 34 with the *Otis Higher Examination*. Items in the latter test were classified into content subtests. No significant differences were found among the correlations between scores on these subtests at age 34 and Arith-Re scores at age 14. Schlosser and Kantor (22) analyzed 163 Wechsler-Bellevue tests and found that they revealed no statistically significant difference between the deterioration ratio of schizophrenic groups as contrasted with a psychoneurotic group.

Mental Decline

The adequacy of each of several methods used to measure mental decline has been supported and refuted by experimental evidence. Some of the more prevalent areas investigated were vocabulary, reasoning, memory, and manipulation. Raven (21) used the *Progressive Matrices Test* and the *Mill-Hill Vocabulary Scale* to trace the normal changes as age advances. His data indicated that the capacity to form comparisons and reason by analogy declined slowly after 25 and that the average person's ability to recall information declined slightly after 50. Babcock Test records of 404 psychiatric patients were analyzed by Rabin (20). He noted an obvious decrease in efficiency with age regardless of diagnosis and a slight tendency for vocabulary increase. Fox (10) used the *English Recognition Vocabulary Test* of Seashore and Erickson with two age groups of 70 to 79 years and 40 to 49 years respectively, and found no significant differences either in the number or quality of definitions between the two age groups. Using the complete Wechsler-Bellevue, Lewinski (19) examined 1000 white males ranging in age from 17 to 62 years and in school training from no schooling to two years of college. He found vocabulary to be a relatively stable function in adulthood. The correlation between age and vocabulary scores was .17. Brown (5), however, found that real differences in learning remain when intelligence

level is statistically controlled and that quality of vocabulary decreases with age. Chesrow and others (6) found no correlation between physical conditions and the Wechsler-Bellevue or Rorschach findings and indifferent correlation between Rorschach results and Wechsler-Bellevue deterioration scores. The Rorschach revealed delayed responses, reduced number of responses, stereotyped thinking, constriction in intellectual and emotional spheres, and impotence. Studying the normal changes in the mental abilities of adults, Foulds and Raven (9) administered the *Progressive Matrices Test* and the *Mill-Hill Vocabulary Scale* to 1967 adults. Rate of decline on the Matrices Test is uniform from age 25 on but the vocabulary scores show little decline to age 60. The ability to form comparisons and reason by analogy reaches its maximum at about age 14, remains constant to about age 25, declines gradually to age 60 and then more rapidly to age 80.

In a study made of Terman's group of 1000 gifted children, Thorndike (25) found that they had regressed some 40 or 45 percent of the way toward the population mean over a 20-year period. This amount of regression is somewhat greater than that presented by Terman (24). Copple (7) derived a set of Beta weights for the purpose of determining a pattern of senescence. He used for his subjects 1403 white males between the ages of 20 and 69. Of this group 531 were normals and 872 were neurotics. When the Senescent Decline formula was applied, the results showed that the mean drops steadily and fairly regularly from each age group to the next older. The data also indicated that the "pattern of senescence is so marked that it stands out clearly in both normals and neurotics and is relatively uninfluenced by psychiatric status." Brown and Ghiselli (4) found that the abilities of older workers in industry are comparable to those of younger ones in speed tasks which involve neither precision nor complex mental processes and in tasks which involve familiar operations and materials. However, inferiority of the older groups was manifest in tasks which involved the abstract and the complex.

Factors Related to Test Scores

An earlier issue of this publication devoted some attention to studies dealing with certain factors that affect intelligence test scores. More recently, Fox and Birren (11) administered the vocabulary subtest of the Wechsler-Bellevue test and a 50-word multiple-choice list taken from the Seashore-Erickson test of 216 residents of a home for aged indigents in an effort to determine the factors affecting vocabulary size in later maturity. They found an indifferent relationship between vocabulary size and either length of institutionalization or age, and between vocabulary size and auditory and visual defects. Guetzkow and Brozek (14) assembled a battery of six tests which measured performance in perception of spatial relations, word fluency, perceptual speed, memory, number facility, and inductive reasoning. They found only slight disturbance of the intellective

functions when these tests were administered to adult subjects undergoing nutritional stresses. One of the most valid studies of the learning ability, as it relates to age, education, and intelligence, was made by Schneider (23). Data were collected on 3134 subjects. He found a correlation of .10 between *General Classification Test* scores and age, of .09 between schooling and age, of .17 between success in learning and age, and of .53 between age and occupational experience. The results showed that age had little effect on the *General Classification Test* scores. Huston (16) found that electric shock treatment did not produce any significant impairment of mental efficiency on patients suffering from depression, hypomania, or psychoneurosis. Allen (1) presented two brief accounts of personality disorders and found that it was impossible to determine whether the stupor reactions were of functional or organic origin. Boice and others (3) presented evidence to show that there was no deterioration in color efficiency from age 20 to 59. However, 25 percent of a small sample of 21 subjects aged 60 and over were color-blind. Also, to show physical deterioration with age, Fisher and Birren (8) using a Smedley hand dynamometer found that muscular strength shows an increase to the late 20's and a decline at an increasing rate from that age upward.

Conclusions

Attempts to measure intellectual decline during maturity and old age are of relatively recent origin. The number of studies reported in the period covered by this chapter pertaining to the specific problem was small and the research was not without its limitations. A number of the studies showed that individual scores on mental tests began to decline after the third decade. The rate and amount of decline varied with the test given and the individual or group of individuals to whom the test was administered.

The data gathered thus far do not tell the final story. The instruments were not sufficiently refined to measure deterioration. Moreover, the instruments used were not constructed for measuring deterioration of the aged, nor were they standardized on the aged. The exact meaning of normal deterioration and abnormal deterioration has not been defined, nor has the exact relationship between physical and mental decline been established.

The outcomes of the studies in the field of senescent decline must therefore be interpreted with considerable caution. In some studies the investigators have given the same tests to both young and old people. In certain instances senescent individuals made lower scores in certain types of tasks within a test. It is quite possible that factors other than mental decline caused the decrease in scores. Furthermore, some of the measurements have been made on aged people in institutions. The assumption that the accomplishment of this group represents the typical accomplishment of the general population may be highly questionable.

The examination of the research on intellectual changes during maturity and old age reported during the period covered by this chapter leads to the conclusion that there is need for (a) much more careful planning of research patterns in this area, (b) more critical and conservative interpretation of the results, and (c) the validation of new instruments for the measurement of mental decline.

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CHAPTER IV

Motor Development and Decline

NANCY BAYLEY and ANNA ESPENSCHADE

CURRENTLY, there is an increasing professional and general interest in the changes which take place in later life. It has, therefore, seemed pertinent to include in this chapter references to researches which are concerned with age changes in motor abilities thruout the entire life span. Motor abilities cover a wide range from large-muscle coordinations, strength and balance or postural control, to fine manual coordinations involving speed and dexterity; from simple reactions to complex, highly-specialized patterns of reaction, including vocational and athletic skills. Numerous studies concerned with specific manual skills of young adults where there is no consideration of changes with age, and which are primarily concerned with learning, even tho the tasks involved are motor in nature, have been excluded from this survey. However, a few studies on laterality which give information on developmental changes have been included.

Altho the age range has been extended and the field broadened, the total number of investigations reported in this area of motor performance has declined during the past three years below that of the preceding three-year period. In fact, the number of references cited in the successive chapters on motor development in the REVIEWS on Growth and Development, has shown a steady decline since the first one appeared in 1941.

Infancy and Early Childhood

For this age range, very little new research on motor coordinations, as such, has been reported in this country. However, several studies of age changes in postural orientations and in the development of handedness were published during the period covered by this review. Ames (1) made cinemanalyses of writing and block building behavior of 179 cases aged 36 weeks to 10 years. She found definite age sequences of posture patterns and hand positions for these activities. The patterns appeared to be related to the general degree of neuromotor maturity.

Gesell and Ames (17), and Ames (1) made a cinemanalysis of the Yale developmental data. These data revealed a tendency for alternating preferences in laterality during growth and also several successive periods of bilaterality alternating with unilateral reaching and manipulation. Hildreth (20) in a study of nursery-school children reported early changes in handedness. Hildreth emphasized the gradual settling down to a preference of one or the other hand and the gradual increase of right-handedness with age. In a series of five articles (21, 22, 23, 24, 25) Hildreth made an extensive review of the whole question of laterality and discussed such

things as probable etiology, age changes, the reasons for clumsiness in left-handed performances, the great extent of bimanual activity in which the nonpreferred hand may be very skilful for specific functions, and methods of training hand dominance. She presented an age curve of the percentage of right-handedness, which shows a rapid increase to three or four years followed by a gradual increase to seven or eight years. A result of possible relevance here was reported by Mintz (32) who found a relatively high percentage of left-handedness in feeble-minded boys aged eight to 17 years.

Age Changes, Six to 18 Years

Data from L. Dewey Anderson's previously unpublished studies of motor performance in 3000 Cleveland children have recently been presented graphically by John E. Anderson (3). These motor performances included (a) measures of grip strength, (b) an aiming test, (c) baseball throw for distance, (d) basket-ball rapid pass, and (e) broad jump for boys and girls six to 18 years of age. The girls were superior to the boys in only one test. They excelled in aiming, which is a matter of fine coordination, not of strength or speed. The boys' superiority in the other tests became more marked in adolescence.

In a study of flexibility (range of movement in joints) in girls six to 18 years of age, Hupprich and Sigereth (26) reported that flexibility of the shoulder, knee, and hip joints declined gradually from six to 18 years. In nine measures, including trunk, head, elbow, and ankle joint measures, an increase occurred from six to 12 followed by a decline. In certain of these trunk, wrist, and leg measures, however, 18-year-olds were found to be more flexible than six-year-olds. Low intercorrelations between measures were found. The authors concluded that flexibility in girls was a function of specific factors.

The effects of physiological maturity on the motor achievements of boys have been studied by Nevers (33). McCloy's classification index (combining age, height, and weight) was correlated with strength, track events, and endurance measures for prepubescent, pubescent, and post-pubescent groups. Strength was found to be most closely related to physical size. In some track events the prepubescent was superior to the pubescent performer.

Jones (28) made a detailed analysis of static dynamometric strength in 176 boys and girls who were tested at six-month intervals from 11 to 18 years of age. Growth curves for boys and girls were approximately parallel up to 13 years, after which they diverged sharply as the girls neared their mature ability, while the boys continued rapidly to increase in strength. Differences in strength were found to be related to rates of physical maturing, and for boys to the degree of mesomorphy in build. Age curves of growth were different for grip, thrust, and pull, and the sex differences varied with the nature of the test.

Seashore (37) developed a reliable beam walking test and reported results on boys five to 18 years. According to his data little improvement was shown after 11 years. However, for a similar test, Heath (2) gave tables which showed continued improvement thru 14 years for both sexes, especially for boys.

In a reaction time experiment on high-school boys 14 to 17 years of age, a slight improvement of hand response with age was shown. When the response involved movement of the entire body, however, the 15-year-old group showed no improvement over the 14-year-olds. In this same response Atwell and Elbel (4) found no significant difference between high-school and college groups.

Several studies in progress, which are pertinent here, have been reported by the Children's Bureau, Federal Security Agency (39), and by the Motor Skills Research Exchange (2). These included such topics as rotary pursuit performance of children in grades five to eight (2), dynamic balance of adolescent boys, and physical performances of secondary-school boys classified by a grid technic (39). Bayley (2) reported repeated measurements on the same children from the age of four thru the age of nine on tests of manual dexterity and some large-muscle coordinations. No information was available as to when or where these studies might be published, but these two sources of information should prove useful to people who are doing research in the areas covered.

Changes in Performance After 18 Years

Altho the literature reveals a spreading interest in mental characteristics of later maturity, relatively little current investigation of changes in motor performances has been reported.

Fisher and Birren (14) studied grip strength of Navy personnel, men and women, and industrial workers. They reported an increase in strength up to the late 20's, followed by a decline which by 60 years amounted to a 16 percent drop from the maximum. Correlations with age, height, and weight were computed.

Welford (2) reported research in progress at the Psychological Laboratory of Cambridge, England, on the effect of aging on throwing at a target, on grid-position matching, on pursuit motor tracking, and on tracing performance. In another report (45) he stated that in simple sensory motor skills all older groups showed on the effector side little change in achievement, but showed some profound changes in method. On the receptor side, some striking changes appear to begin in the 30's.

It was evident that some kinds of motor abilities were more subject than others to the effects of aging. Some of the apparent inconsistencies between studies were in all probability due to differences in the samples studied. Skilled athletes might be very different, in this respect, from those with

average or poor motor coordinations. Here, again, the most conclusive answers could be drawn from series of retests of the same individuals.

Measurement

During this period there has been some activity in the development of tests of motor abilities. These additions to the supply of measuring instruments should be useful in gaining more adequate information concerning the nature of motor abilities and their age changes in both old and young.

Continued interest in the Oseretsky scale of motor proficiency tests was demonstrated by a number of publications. The tests are now readily available (6, 13, 38). Lassner (30) published an annotated bibliography of 44 references which contained some reports of these tests. Results on Italian children (16) and feeble-minded groups (6) have been published. A progress report on standardization of the battery for children three to nine years of age and also a report of a study on female mental defectives was made (39).

Clarke (7, 8) described a tensiometer and test procedure for measuring strength of muscles activating movements of the joints. Different test positions between 20 and 25 degrees apart were selected. The studies showed that a muscle exerted its greatest power when it functioned at its greatest tension, and that probably there was a position in which each muscle group functioned the best.

A motor fitness test for college men developed from factor analysis of an extensive battery was described by Cureton (11). Fourteen items were in this test; a short screening form was also presented.

Norms for performances of elementary-school boys and girls, Grades IV thru VIII, on the *Indiana Physical Fitness Test* have been published by Franklin and Lehsten (15). This test included such items as chins, push-ups, and vertical jump.

Norms for Wisconsin high-school boys in physical education activities such as push-up, pull-up, and potato race are now available (29). Swimming norms for high-school and for college men were reported by Hewitt (18, 19).

Van der Lugt prepared an American adaptation of her previously developed (European) test of manual ability for children aged six to 12 years (44), and also a test for adults (43) which utilized the same materials. According to these tests the most rapid development in manual coordinations occurred between the ages of six and nine years with little difference between the sexes. Van der Lugt made a number of comparisons between the test scores and other variables, primarily from her European material. Among these she reported no relation with handedness, mental ability (except in cases of mental deficiency), marked inferiority in performance of the nonpreferred hand, or motor patterns which appear to be related to personality traits. The tests should prove valuable in investigations of similar variables in this country.

Another test of manual ability was the *Small Parts Dexterity Test* of Crawford and Crawford (10) standardized on high-school students and adults.

Relation of Motor Abilities to Other Factors

Race and sex differences in physical performance have been noted by Jokl (27) on the basis of data collected in South Africa. He stated that physical efficiency might be regarded as a secondary sex characteristic. Bantu were found to have a superior performance capacity as compared with whites, and their superiority was relatively greater in the case of girls.

A study by Codwell (9) of the motor performance of American Negro boys classified according to degree of hybridity showed no reliable differences among groups.

Van Dalen (40, 41, 42) investigated motor abilities of adolescent boys and girls in relation to the frequency, duration, and types of play in which they participated. Time devoted to play was more highly related to CA and MA than to motor quotient or physical fitness index. However, these latter were significantly correlated with both frequency and duration of play.

In a study of motor learning of feeble-minded girls, Brace (5) found that IQ was more closely related to motor ability, strength, and athletic ability than was the case with girls in the same age range but with normal intelligence. Correlations of the order of .5 were obtained. However, motor learning scores were not significantly correlated with IQ.

Curtis (12) gave the *Purdue Peg Board Test* to 70 blind adults of normal intelligence. Tentative norms showed that the blind subjects were markedly handicapped in both functions tested but less so in "assembly" than in "insertion."

Twenty third-grade children exhibiting extreme levels of achievement in motor tests were selected for study by Rarick and McKee (35). Ten children ranking high were compared with 10 low ranking children in physical, mental, and social characteristics recorded in "life histories." The superior children were found to be older, taller, heavier, and stronger, were early walkers, were more active, and appeared to have had more opportunity for play than was true for the low ranking cases. These findings were in accord with those of other studies on adolescents including the current study of Jones (28).

Nature of Motor Abilities

Seashore and others (37) published a factorial analysis of arm-hand precision tests based on 100 college men. The measures selected were relatively uninfluenced by strength and speed, were free of the effects of muscular fatigue, and showed little practice effect. A single factor of steadiness could not account for the variance in the battery. Stationary

steadiness was not highly related to precision of movement. Spatial factors were found to be present.

A series of physical education tests for college women were factored by Phillips (34). This study appeared to raise more questions than it answered. However, the results indicated that certain test batteries did not measure for this age and sex what they purported to measure.

Physical ability tests and motor learning scores for high-school girls were factored by McCraw (31). The several types of motor learning proved to be unrelated to each other.

Indications for Future Research

A real need is indicated for a coordinated series of studies investigating age changes in the organization of both gross and fine motor abilities and their interrelationships. Further longitudinal studies of increments and decrements with age for different types of motor performances, and for different kinds of populations, should be planned. There is need, too, for information about the effects of attitudes and incentives on age changes and sex differences in motor ability scores.

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CHAPTER V

Personality and Social Development

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THE problems involved in investigating personality development and social development are so closely related that it is difficult, if not impossible, to separate them. An individual's behavior in social situations is a direct measure of his personality development. Jerome S. Bruner (19) in a recent review of social psychology and the group processes referred to the "increasing smudging of the boundary between social psychology and the psychology of personality." In spite of the fact that studies of personality development and social development have been treated in separate chapters in previous reviews on this topic, they are presented in a single chapter in this issue.

During the past three years research workers showed considerable interest in the field covered by this chapter. This was a continuation of a trend which began some 10 or 15 years ago. Psychologists as a group have shown a growing concern with the problems of personality and social growth and with the factors affecting the individual's total adjustment to his social and physical world. If space permitted, several hundred specific investigations falling in the general area of this review could be cited. Since it is necessary to be highly selective, only a fraction of that number have been included and discussed here. The studies are grouped under the following headings: (a) effect of early infant experience on personality, (b) family relationships and personality development, (c) studies of prejudice, (d) culture and personality, (e) personality change with age, (f) personality development of handicapped individuals, (g) studies of social relationships, (h) physical and biological determinants of personality, and (i) technics for evaluating personality and social development.

Effect of Early Infant Experience on Personality

Freudians have long held that the experiences of early infancy leave lasting marks on the individual's personality. They have been especially concerned with the effect of infantile suckling, excretory, and genital experience on adult personality. In general their conclusions have been based upon a theoretical position rather than upon research. Goldman (36) proposed to make an experimental attack upon such problems. Using the method of factor analysis she reported the existence of two types of individuals, oral pessimists and oral optimists. She promised to provide evidence in a later paper of the effect of length of breastfeeding upon the development of these personality types.

Orlansky (67) reported an excellent summary of existing objective

studies dealing with the effects of nursing experiences, mothering, sphincter training, restraint of motion, etc., on personality development. He concluded that there was no evidence that breast-fed babies were better adjusted in later life than bottle-fed babies, or that children who received early or late sphincter training were particularly different from other children. In general, the data he amassed do not seem to support the Freudian notion that certain specific infant experiences provide the overwhelming basis for adult personality. Instead he was led to believe that the total cultural context in which a specific practice was embedded plays a more decisive role. Support for this position was found in Benedict's (10) study of the effects of swaddling on Russian, Polish, and European Jewish children. She concluded that the child's character is not determined by the overt details of early infant care, but by the attitudes and motives communicated to the child by the mother in connection with the practices employed.

Family Relationships and Personality Development

An excellent example of research on parent-child relationships and personality development was found in the study by Baldwin (7) which was conducted at the Fels Research Institute. The specific purpose of the investigation was to explore the consequences of democracy in the home upon the personality development of 67 children who were approximately four years of age. These children were observed in free play situations in the nursery school. Their behavior was recorded on a rating scale by independent observers who also rated the extent to which the homes from which the children came were democratically or autocratically operated. Democracy in the home was found to produce children who were active, aggressive, fearless, planful, likely to be nursery-school leaders, more likely to be cruel than average, curious, and nonconforming. Children from authoritarian homes tended to be quiet, well-behaved, socially unaggressive, and restricted in curiosity, originality, and fancifulness. In a California investigation involving a developmental study of 500 nursery-school children over a three-year period, Koshuk (54) reported that children coming from homes where the parents disagree on methods of discipline are much more often problem cases than are children whose parents agree on methods of control.

Family influences having a relationship to delinquency were studied by Jenkins and Glickman (49). These investigators found three types of delinquent children, (a) an unsocialized aggressive group, (b) a socialized delinquent group, and (c) an emotionally disturbed delinquent group. The unsocialized aggressive boys predominantly came from homes where they had experienced parental rejection; the socialized delinquents were better accepted at home than the aggressive delinquents and came from larger families, but were reared under conditions of extremely lax discipline. The emotionally disturbed delinquent tended to be the

unfavored child in his family and to come from a smaller family than either of the other two groups. In another study of problem children, Sloman (91) analyzed the family backgrounds of 62 individuals who were referred to the Chicago Juvenile Court. All the cases in the particular group were "planned for" children, i.e., children who were originally wanted by their parents and whose births were definitely scheduled. The findings revealed that many of these children had been wanted in an effort to remedy marital difficulties. The largest number, however, were children of compulsive and perfectionistic type mothers who liked to plan everything and who were often disappointed when their children failed to meet their expectations as to sex or achievement. This study seemed to imply that whether a child was planned for or not was of little importance so far as the child's character and personality were concerned. The really crucial point was whether or not he was wanted and made to feel secure after he arrived.

Studies of the relationship of personality and character development to family organization and control have also been made by Brown and others (18) and by Sherman (88). Brown's study revealed correlations of above .40 between character development as measured by his scales and certain types of family relationships. Sherman did not find any very significant relationships for the group studied by him. He attributed this to evidence he obtained that the parents did not honestly and objectively answer the questionnaires submitted to them, but instead gave answers which placed them in the most favorable light possible.

Studies of Prejudice

Numerous investigations during this period have dealt with the social and psychological roots of prejudice. The most monumental of these have been sponsored by the American Jewish Committee and published in three volumes.

The first volume, written by Adorno and others (2), represented a large scale study of prejudiced and unprejudiced individuals, and revealed a close correlation between a number of deep-seated personality traits and prejudiced behavior. In the course of this research, scales for measuring anti-semitism, ethnocentrism, Fascistic tendencies, and politico-economic conservatism have been developed. The second volume, by Bettelheim and Janowitz (13), considered the connection between personality traits and prejudice as found among war veterans living in a large American city. The third volume (1) derived its data from case histories of a number of individuals who received psychotherapy. The specific conclusions from these three books were too numerous to report here, but provided the basis for the following summary statements: (a) people who professed religious affiliation were more prejudiced than those who did not; (b) that individuals who scored high on the conservatism test were more prejudiced than those who were more liberal; and (c) that individuals who accepted

parental attitudes were more prejudiced than those who did not do so.

Rosenblith (78) repeated the Allport-Kramer (4) study using as subjects students in nine colleges in South Dakota. In spite of the almost total absence of Negroes and Jews in the region, there was evidence of more prejudice toward these groups than was found by Allport and Kramer among students in New England where greater opportunity existed for contact with these minority groups. War veterans were also found to be more prejudiced than nonveterans.

Rokeach (76) found that prejudiced individuals showed more rigidity and inflexibility of thinking than nonprejudiced subjects even when dealing with such nonsocial problems as arithmetic. Campbell (21) obtained high correlations between dissatisfaction with personal economic circumstances and prejudice toward Jewish people. Other studies of factors related to prejudice have been made by Miller and Bugelski (66), Hayes (45, 46), Saenger and Schulman (81), Radke and Sutherland (73), Razran (74), Schonbar (82), Katz (51), Zeligs (107), and MacKenzie (64).

An experimental study by Lindzey (56) revealed that the scapegoat theory had serious limitations as a general explanation for prejudice. Zawadzki (106) in a theoretical article likewise criticized the scapegoat hypothesis on the grounds that it failed to explain why prejudices were directed toward some minority groups and not toward others. He indicated that the behavior of a minority group may be one of the factors in the total causation of the prejudice.

Bayton and Byoune (9) studied the racial prejudices of deep-south Negroes. They seemed to stereotype members of their own race in much the same manner as did whites. Their attitudes toward Germans, Japanese, and Jews were also very similar to those held by whites. In describing white Americans, however, such terms as pleasure-loving, grasping, deceitful, and cruel were frequently used, indicating that the stereotypes they held tended to be of somewhat unfavorable nature.

Studies of methods of reducing prejudice were made by Rosen (77) who found that the motion picture "Gentleman's Agreement" had the effect of reducing prejudice toward Jews, and by Axline (6) who presented evidence to show that play therapy could accomplish similar results. Williams (102) and Wirth (104) presented two important theoretical discussions and appraisals of methods of ameliorating prejudice.

Culture and Personality

Cultural anthropologists and social psychologists have shown continued interest in the relationship between cultural patterns and the personality development of individuals. Studies in this area fell into two major divisions, (a) those dealing with entire national or tribal cultures and (b) those concerned with subcultures within a broader general culture. In the first category such contributions as those of Gorer (37) and Mead (65) might be placed. Basing his conclusions on

the findings of Elmo Roper's *Fortune* surveys over a ten-year period and other general observations, Gorer concluded that there is a typical national American character. He developed the idea that this character arose from the rejection of the father figure of authority and the acceptance of the mother figure of discipline. Mead's book based upon materials drawn from seven Pacific cultures showed that great variations exist from culture to culture with respect to masculine and feminine traits. Personal characteristics attributable to general cultural practices of a given people were also found by Billig, Gillin, and Davidson (14) in Guatemala; by Sereno (86) in Puerto Rico; and by Wallace (99) who studied the Mohave Indians.

Examples of studies dealing with personality variations among subcultures and class groups of a given culture were reported by Hollingshead (48), Centers (25), and Loomis and Powell (58). Hollingshead's investigation dealt with adolescents who belonged to five social classes in Elmtown. Each class was found to have value systems and modes of behavior which distinguished it from the other classes. The treatment accorded adolescents in school by their teachers also varied according to the class to which the adolescent belonged. The Centers' study not only presented data on the psychological differences between social classes, but also developed a theory as to the origin of class consciousness. Loomis and Powell made a sociometric analysis of class status in rural Costa Rica.

Altho not specifically directed toward a study of social classes, the Kinsey investigation (52) showed differences to exist between individuals of the lower and middle classes with respect to sex attitudes and practices. Stendler (93) studied the extent to which elementary-school children were aware of the symbols of social class. Her findings indicated that first-grade children were almost entirely lacking in such awareness, but that by the time children reached the fourth grade they began to understand the meaning of class differences. Sixth- and eighth-grade children were very much like adults with respect to their knowledge of social class symbols. Bossard and Sanger (16), using the data amassed in a case study, reported the consequences of social mobility on a young child. They noted that such changes as the following occurred in the child's behavior: (a) increased feelings of insecurity and uncertainty, (b) increased feelings of isolation, and (c) marked increase in verbalization.

During the past three-year period, two excellent anthologies by Haring (41) and Kluckhohn and Murray (53) dealing with research in the field of culture and personality appeared.

Personality Change with Age

Gray (38) studied the extent to which changes in Jung's psychological types took place with increase in age. His subjects consisted of 500 males and 500 females who ranged from 10 to 80 years of age. These individ-

uals were administered a questionnaire based upon extraversion-introversion inventories with additional questions added embodying further ideas expressed by Jung. The results showed that definite changes in personality accompany age increases. In general, he found that as people grow older, they tend to use their thinking slightly more than they do in their youth, to develop their sensation-function considerably more than they do in earlier ages.

Utilizing research studies as the basis for their conclusions, Harsh and Schrickel (43) traced the typical stages of personality development revealed by individuals from infancy to old age. Perhaps the most significant difference they noted between the adult and childhood personality was that the adult personality was more rigid than that of the child. Adults strove for a more limited set of goals than did adolescents, for example, and sought a continuously slower and more regular tempo of living.

Hartley, Rosenbaum, and Schwartz (44) investigated the relation of age to children's ethnic frames of reference. They found that children three and one-half to four and one-half years of age usually replied by giving their own name when asked the question, "What are you?" For the age group four and one-half to five and one-half this type of response was still given by some children, but many began at that age to use ethnic designations rather than personal ones. From the age five and one-half on, the child's conception of himself and others tended to be expressed almost entirely in ethnic terms. He considered himself or his neighbor as "American," "colored," "Jewish," "Catholic," "Italian," "Spanish," etc. Remmers and Weltman (75) found older children (Grades XI and XII) to be less like their parents in attitude patterns than younger children (Grades IX and X). This was a natural trend which would be expected in view of the strong drive for emancipation from the family found during adolescence.

The adjustment problems of the aged have continued to interest research workers in this field. A report by Pollak (71) pointed out a group of research problems in this area that demanded immediate attention and suggested technics for investigating them. A study by Fried and Stern (33) presented data on marital and other relationships found among 39 subjects in the 50 to 64 group and 36 subjects who were over 65 years of age.

Personality Development of Handicapped Individuals

Johnson (50), using sociometric technics, studied the social position of mentally handicapped children in regular school classes. The 39 children included in the investigation all had IQ's of 69 or below as determined by the 1937 Revision of the Stanford Binet, Form L. He found that the majority of the children were socially isolated, and that many of them were actively rejected by their classmates. The percentage

of mentally handicapped children suffering social maladjustment in regular classes was found to be statistically greater than that of typical groups which he used as controls. The study was carried out in two communities which had no special classes for mentally handicapped children. Cruickshank and Dolphin (26) investigated the emotional and social characteristics of crippled and noncrippled children using as their instrument of evaluation the *Raths Self-Portrait N Test*. They concluded that crippled children, on the average, differ little if any from noncrippled in so far as social and emotional adjustment are concerned. They did, however, suggest that crippling may have a deleterious effect upon the social adjustment of given children, depending upon the attitudes they hold toward their physical disability.

McAndrew (61), studying the personality structure of deaf and blind individuals, found the deaf and blind to be more rigid in the Lewinian sense than sensory normal individuals. Of the two groups, the deaf showed the more rigidity. He used the Rorschach test with the deaf and concluded that on the whole they reacted as normal children of a somewhat younger age.

Several studies of the personality characteristics of individuals suffering from various diseases were reported during this period. Wiener (101), using the *Minnesota Multiphasic Personality Inventory*, tested disabled war veterans suffering from arthritis, asthma, gunshot wounds, malaria, and duodenal ulcers, and compared their scores with those of nondisabled veterans. He found that numerous distinguishing characteristics existed between the disabled and the nondisabled. Benjamin, Coleman, and Hornbein (11) reported on a year's study of personality in pulmonary tuberculosis. One part of the investigation involved the administration of the Rorschach test to 16 subjects. This group as a whole showed a very high incidence of psychopathology as compared with the Rorschach records of normal groups. Phillips, Berman, and Hanson (70), using the *California Personality Test*, examined 101 Minneapolis children who had had poliomyelitis during the year prior to the study. They found no reliable difference between the group of children who were victims of polio and a control group of children.

Studies of Social Relationships

An increasing number of studies have dealt with problems and factors involved in interpersonal group relations. Of these, a large number have investigated the dynamics of friendship. Lundberg and Beazley (59) investigated the entire population of a college the following question: "If, after leaving college, you could keep in touch with only three students now in college, which three would you choose?" The results indicated that common domicile was by far the most significant factor entering into the choices. Following this in order were college class, major scholastic interest, and socio-economic status. Scholastic standing and aptitude

showed little or no association with the preferences. In another study, Lundberg, Hertzler, and Dickson (60) found that persons disliked tend to be chosen from much the same groups as those liked. Propinquity thus appeared to be a dominant factor in both likes and dislikes. The role of propinquity in the formation of friendships was also clearly shown in the studies of Faunce and Beegle (29) and Austin and Thompson (5). Grossman and Wrighter (39) studied the relationship between selection-rejection and intelligence, social status, and personality among sixth-grade children. They found that intelligence was related to selection of friends up to a certain point, that of normal intelligence, but beyond that point no relationship existed. Social status was found to be related to popularity, but the association ceased for levels above the middle class. The more popular children were found to be better adjusted than the less popular as measured by the *California Personality Test*.

Bonney (15) made an intensive study of five very popular and five very unpopular children who had been identified by means of sociometric tests. He found that popular children differ significantly from the unpopular children in conformity and group identification, emotional stability and control, social aggressiveness, adaptability and tolerance, dependability, social service motivation, and several other traits. Thompson and Horrocks (96), studying the degree of friendship fluctuation for children in Grades VI to XII, found a trend toward greater stability in the friendships with increasing chronological age. Hare and Hare (40) found that the number of friends possessed by a family increases with length of stay in the community and varies with the presence or absence of children in the home. A negative correlation existed between number of friends and amount of expenditure for recreation outside the home.

Gibb (34) presented a theoretical discussion of the principles of leadership and gave data to support his position. He concluded that leadership is not a quality which an individual possesses, but is rather a function of the interaction of the individual's personality and a specific social situation. Wherry and Fryer (100) designed a study to determine if "buddy," "peer," or "co-worker" ratings would provide effective criteria of leadership. They found that buddies and peers were better raters of potential leaders than officers and classroom teachers.

Rosenthal and Cofer (79) studied the effect on group performance of indifference and nonparticipatory behavior on the part of one member of a given group. They found that such behavior of one member tended to shift the attitude of the whole group in the direction of disbelief in the attainability of the group goal. Preston and Heintz (72) presented experimental evidence to show that participatory leadership is superior to supervisory leadership in producing changes in group judgment. Other important contributions in the area of group dynamics were Lippitt's (57) investigation of group skills, Benne and Munyan's (12) anthology of readings on-group development, Lewin's (55) *Resolving Social Conflicts*, and Bales' (8) method for the study of small groups.

Physical and Biological Determinants of Personality

The relationship of biological and constitutional factors to personality manifestations continued to engage the energies of research workers. In general the correlations tended to be relatively low, but were often statistically significant. Sheldon (87), in a new study of body build and personality, investigated 200 delinquent young men who were residents of a Boston rehabilitation home. He found delinquents on the whole to be decidedly more mesomorphic than a control group of college males. The delinquents were also found to be below average in what Sheldon terms the T component, a measure of aesthetic quality of the physical structure. Seltzer, Wells, and McTernan (85) analyzed the temperaments of 51 males whose body types were predominantly ectomorphic. They found a strong and statistically significant relationship between ectomorphy and the psychotype known as cerebrotonia. This research appeared to confirm some of the earlier findings of Sheldon.

In a monumental study, Franklin, Schiele, Brozek, and Keys (32) investigated the effects of semistarvation on human behavior. Thirty-six young men were included in the experiment and placed on the inadequate diet for a six months' period. The behavioral changes produced were profound. As a result of the treatment, the men became depressed, irritable, nervous, emotionally unstable, socially withdrawn, uninterested in sex, and preoccupied with thoughts of food.

Franklin, Feldman, and Odberg (31) discovered significant relationships to exist between bodily movements while dancing and certain personality traits. Seltzer (84) noted that hair color, eye color, and cephalic index were associated to some extent with personality traits. The trend was for individuals with darker shades of hair and eye color to exhibit traits indicative of lesser integration, lesser stability, and greater sensitivity. Rounder-headed individuals were found to be more stable than those with less round heads. Brower (17) obtained substantial correlations between several Rorschach categories and such physical variables as pulse rate and diastolic blood pressure. McCurdy (62) found a significant relationship to exist between basal metabolism and academic performance. Hoagland (47) presented evidence which seemed to indicate that certain chemical conditions in the body are involved in the psychoses. Five additional studies which showed relationships to exist between constitutional factors and personality were reported by Kluckhohn and Murray (53).

Technics for Evaluating Personality and Social Development

Projective technics for the study of personality continued to be developed in great numbers during the period under review. In most cases the tests were of an intriguing nature and showed considerable

promise of usefulness, but the problems of validity and interpretation still plagued them to a great extent. Drawing of the human figure, which was used originally by Goodenough as a test of intelligence, was utilized in diagnosing personality. Machover (63) wrote an entire book on the possibilities of this method, and Buck (20) included the drawing of a person in his H-T-P technic. Studies (3, 80) of the reliability and validity of the draw-a-man-and-a-woman technic also appeared.

A new projective instrument that has caused considerable interest is the Szondi test (27). This test included six sets of photographs which are presented to the subject one set at a time. Each set contained a picture of a homosexual, a sadist, an epileptic, an hysterical, a catatonic schizophrenic, a paranoid schizophrenic, a manic-depressive depressive, and a manic-depressive manic. The subject was told to choose the two pictures best liked and the two least liked in each set, and finally, the four best liked and the four least liked in the whole group. The types of photographs selected and rejected were supposed to give insight into the subject's personality structure.

Handwriting received increased attention as a projective device for analysis of personality. Wolff (105) and Sonnemann (92) each produced a book on the subject which incorporated the results of some research. Investigations by Secord (83), and Pascal and Suttell (68), cast considerable doubt as to the efficacy of this type of method, but a study by Castelnuovo-Tedesco (23) seemed to corroborate some of the claims of the graphologists.

Other interesting projective devices which have been developed included a test of masculinity-femininity (30), a bas-relief test for the blind (42), the "three impossibilities test" (28), the "institution questionnaire" (89), and the *Make-a-Picture-Story Test* (90). Studies of such older projective technics as finger and easel painting (69, 103) and the *Sentence Completion Test* (94) continued to be made. Carter (22) described a method for investigating affective processes which combined a projective technic with the use of the psychogalvanic response.

A test of altruism was devised by Turner (97), and numerous instruments for evaluating the prejudiced personality were prepared by Adorno and others (2). Van Der Merwe and Theron (98) found the Goetz finger plethysmograph a useful device for measuring emotional stability, and Gladstone (35) developed a group palmar sweating test which also possesses some validity in evaluating certain states of emotion. Cattell and Luborsky (24) described a new clinical method for determining personality and symptom structure known as the P-technic which involves the factor analysis of data secured from repeated testing of the individual. Excellent reviews of research on personality tests were made by Symonds and Hessel (94).

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CHAPTER VI

Physical Growth and Physiological Aspects of Development

KAI JENSEN

Introduction

RESEARCH workers representing practically all of the fields of the sciences appear to have been studying the problems of human physical growth and physiological development during the period covered by this volume. They have employed methods ranging from the use of radioactive isotopes to questionnaires and ranging from controlled experimentation of excellent design to anecdotal records. The common goal is greater understanding of the factors influencing growth and development with the ultimate objective of better prediction and control.

This concerted and diversified attack upon the problems involved is producing a vast literature. In the field of the metabolic functions of the endocrine glands alone approximately 600 pertinent articles were published from July 1948 to June 1949 (158). Obviously a review such as this cannot do more than present a few representative developments which may be of interest to educators.

The physical and psychological growth of children thru the school years was treated effectively in a representative general text prepared by Breckenridge and Vincent (20). In this carefully integrated analysis of human development several chapters were devoted to physiological and neuropsychological functioning and the environmental impact upon the biogenetic endowment. It also included a very complete and excellent bibliography. Elsewhere splendid reviews of the literature dealing with specialized problems of growth (22, 133, 174) and physiological development (107, 142, 158, 162) have been made available, and several general theoretical considerations of some of the basic problems involved have been published (27, 45, 113, 120, 163, 165, 166, 170).

Prenatal Development

The genetic die is cast once the sperm enters the ovum and the environmental biogenetic cooperative enterprise is begun. Pregnancy tests have been developed which can ascertain this fact with considerable accuracy in the intact human at an early date. One such test (17) demonstrated an accuracy of 98.7 percent, and another (43) claimed an accuracy of 100 percent when certain conditions were fulfilled.

Prenatal development has been studied by many, and, since Menken and Rock (93) succeeded in fertilizing the human ova *in vitro*, the

developmental process has been followed from the moment of conception (141), revealing the total developmental picture more clearly than ever before. The development of special fetal segments such as the pulmonary vein (8), the auditory vesicles (11), the cervical vesicles (42), the carpus (121), and the biparietal diameter (68) have been described in considerable detail. Arey (7) developed a new rule for correlating the age of human fetuses with size in inches.

Nieburgs (108), and Nieburgs and Greenblatt (109) developed a smear test for diagnosing the fetal sex during pregnancy. Their evidence indicated that maternal hormone levels change in accordance with the fetal sex and unless the maternal hormones mask those of the fetus the presence of specific smears in the vagina may be used to determine sex. The needed specific estrogenic and androgenic smears were of low incidence which limits the applicability of the method.

The association of maternal rubella (German measles) with congenital defects is still being extensively investigated. Wesselhoeft (168) presented evidence to show that during the first trimester of pregnancy, rubella in the mother was etiological in the production of defects to the eyes, ears, heart, brain, and teeth and in some cases even caused the death of the fetus. Some are so convinced of the relationship that two drastic proposals have been made: (a) that all be exposed to the disease in childhood, and (b) that abortions be legalized for women who have rubella during the first trimester of their pregnancies (168).

Many of the problems associated with the Rh factor are still unsolved, but new facts are continually being brought to light. Potter (125) studied 96 women who had 179 pregnancies following the birth of an earlier infant with erythroblastosis. The picture was an appalling one. Only three of the infants were Rh-negative. Thirty-two of the pregnancies ended in abortion and of the remaining 144 Rh-positive infants with erythroblastosis, 69 were stillborn, 63 died post-natally, and only 12 survived, and of these, three had definite brain damage. Gerver and Day (44) reported on the intelligence quotients of 68 children who had recovered from erythroblastosis fetalis without suffering obvious motor nerve damage. Average IQ impairment was 11.8 when comparisons were made with control siblings. The authors concluded that these outcomes were not due to chance or to the circumstance that the affected child was always younger than his control sibling. They carefully pointed out that their data did not distinguish between a specific effect of the Rh antibody and a nonspecific one such as might be operating in any illness in the newborn period.

Several studies of the influence of maternal diet have been made. In one study employing the method of matched siblings, in order to reduce hereditary and environmental variables (21), it was found that in general birth weight and length of the infant decreased as maternal diet became poorer. Sontag (151) studied the diet history of 203 mothers and found that the observed variations in maternal protein intake failed to produce

detectable changes in the offspring's weight, length, or skeletal ossification at birth, one, six, and 12 months after birth. This was in line with other dietary studies which seemed to show that considerable biological reserves or margins of safety were present. All agreed that severe quantitative and qualitative hunger in the mother was of great consequence for the development of the fetus and the vitality of the newborn child. These considerations, and studies of the effects of wartime diets (6, 36, 149), suggested that the effects of both acute malnutrition and chronic malnutrition as well as the time factor in nutritional studies of pregnancy should be carefully analyzed and studied.

Knaus (76) reported that the size and the weight of the newborn child are largely dependent on the weight of the placenta under normal conditions. Sinclair (148) found that the placental birth-weight ratio decreases linearly with birth weight in the case of full-term births. High placental birth-weight ratios were found in both prematures and postmatures.

Mortality Considerations

The most hazardous period in the life of the infant is the first day of life (105). Twenty-nine percent of all infant deaths in the United States in 1945 were babies under one day of age. The most frequent causes of death were prematurity, pneumonia and influenza, congenital malformations, injury at birth, and diarrhea and enteritis in that order. In 1915 about one out of 10 babies born alive failed to survive the first year of life, but by 1945 this had been reduced to the point that only one out of about 27 infants born alive died before the first birthday. Infant mortality rates in the United States continued to decline in 1946 and 1947.

The infant mortality rate for rural residents was lower than that for urban places with 10,000 to 25,000 population, and with 5000 to 10,000 inhabitants, but was higher than that for large urban cities (104).

Mengert (92) found that approximately 4 percent of fetuses reaching a size and degree of development compatible with extrauterine existence died before, during, or soon after birth. The chief over-all cause was anoxia, and he dogmatically attributed this to the analgesic and anesthetic drugs used to relieve the pain of labor. Hughes (59) took an experimental approach to this problem and found that electroencephalograms of the newborn served as sensitive indicators of the effects of analgesics and anesthetics. His results to date seem very promising. Plattner (124) studied 2910 premature infants and found that approximately 18 percent died. Kerpel-Fronius (71) reported that in Budapest the problem of infant mortality was primarily a social and financial problem.

Sudden and unexpected natural death is chiefly found in male children and rarely occurs beyond the age of three years (130). From 10 to 14 is the golden age of childhood if measured by mortality (12).

Some Factors Conditioning Post-Natal Growth and Development

The effects upon longevity and mortality of premature birth, plural births, and the Rh factor were considered by Dublin, Lotka, and Spiegelman (33). Glaser, Parmelee, and Plattner (48) observed 163 premature infants during a two-year period (1945-1947) at two-week intervals for eight months. The peak of growth was reached during the second and third two-month period. A study of 2426 children whose birth weights ranged from less than five pounds and eight ounces to more than nine pounds and eight ounces (65) revealed that at all ages the birth weight bore a constant relationship to the subsequent physical development.

The body measurements of 96 pairs of brothers were studied to discover familial influences (56). Longitudinal measurements were found to be most alike and nose breadth and ear length and breadth least responsive to the factor of brotherhood. In another study of 186 brothers (55) birth order was found to have no constant influence on adult body form.

Geographic and racial influences upon growth and development were studied by several workers. Children in Okinawa (94) were found to compare unfavorably in head circumference at birth and in height and weight at birth, three years, six years and 10 years with children in France, South Africa, and North America. Shanghai children (106), aged four to 11, who were studied in 1945 were significantly shorter and underweight as compared with children in 1939. Several factors, including the education of children and parents of Aleutian children in matters of nutrition and hygiene, resulted in somewhat better than average growth and development and reduction of serious illness to a minimum (171). In a group of mothers ranging in age from 10 to 54 years (152), the frequency of stillbirths at all ages was found to be significantly higher for a colored population estimated to be 95 percent Negro than for the white population studied. Sixteen different body measurements of 1986 Minnesota schoolboys ranging in age from six to 17, of whom 1102 were of Finnish lineage and 884 of Italian descent, were studied by Matheny and Meredith (91). They found the boys of Finnish descent larger than the boys of Italian lineage at all ages in all measurements except face length and width, and in head width at the upper levels.

Aldrich (3) presented a thought-provoking comparison of laws of the social order and laws of growth and development. Fried and Mayer (40) concluded that socio-emotional disturbance as a cause of growth failure is much more frequent and more extensive than is generally recognized. Kessler and Scott (73) confirmed previous findings of the relation of epiphyseal maturation to birth weight, body length, and sex, but were unable to demonstrate any relation between economic status and milk intake during pregnancy and the diameters of the distal femoral and proximal epiphyses or with roentgenograms of the knees. The effect of wartime conditions on children was shown to be dependent upon the severity of prevailing deprivations (7, 37, 149) and the use made of available food supplies.

In a longitudinal study of the illness experience of 126 normal children (14), it was found that only a small percentage became afflicted with permanent ill health altho every period of childhood had its special health hazards. No constant relation between illness patterns in children and their ordinal position in the family was found by Kingsley and Reynolds (74). Children with diabetes mellitus (15) lagged behind normal children in body size and growth rate during the normal growth period, but continued to grow after the time that growth was usually terminated for the normal child. This growth continued until they attained normal stature. When an adequate diet was available, control of active allergy (24) resulted in remediation of the growth failure caused by the allergy. Wilson and Lubschez (172) studied longevity in rheumatic fever in 1042 children observed over a period of 30 years. Four out of five survived to the age of 10, three out of four survived puberty, and of those reaching the age of 20, 19 out of 20 survived early adult life. The over-all chance of survival to the age of 40 was one out of two. Prolonged separation from the home for institutional care in the cases of 600 children with rheumatic fever failed to produce major adjustment problems or to disturb the integrity of family life (156). This would seem to demonstrate that the manner of doing may outweigh other considerations.

The general problem of the relationship of endocrine conditions to growth and development was dealt with by several individuals (18, 117, 147, 155). Hench and Kendall, in a series of papers (52, 53, 54, 70), reported the epoch-making results of the administration of cortisone (Kendall Compound E) and ACTH in rheumatic arthritis and other diseases. These brilliant approaches to the treatment of certain diseases have opened entire new fields for research and the clinical application of the results of research. It is particularly interesting that the compound in question was first synthesized many years ago and that its practical application was of very recent date.

Dietary and nutritional influences upon growth were studied by a large group of workers (1, 79, 113, 115, 123, 169). One of the most significant outcomes pertained to the effects of restricted caloric intake upon aging and disease (10, 83, 118, 134). A group of experiments showed that animals fed from birth on diets deficient only in calories enjoy an extended life span, accompanied by a lower incidence of tumors and other diseases. In one experiment (10) the incidence of cancer in mice restricted in caloric intake thru their whole life was zero. McCay (83) stated that, in addition to increasing general longevity, such diets may produce less aging of special organs such as the kidneys and lungs. Certainly the general nutritional theory that the bodies of growing boys and girls should be continually supplied with an excess of essential nutrients needs reexamination. *Nutrition Reviews* (118) presented a good brief review of current work in this field.

Extradietary factors, notably the endocrine glands, were found to

exert a profound influence in determining what tissues are actually formed from the available building blocks (117). In the past there has been a tacit assumption that with adequate diets the utilization by the body was the same in all cases, at least from a qualitative point of view. There was important evidence to show that the utilization by the body may vary greatly and this must be taken into consideration in any accurate appraisal or evaluation of growth. Li, Simpson, and Evans (81) found that animals receiving growth hormone showed nearly five times the weight gain of hypophysectomized female rats of the same age that were on the same diet.

Growth—Stature and Weight

Several studies of various aspects of growth as measured by stature and weight were made during this period (29, 34, 35, 41, 47, 49, 65, 100, 106, 138). Edgerton, Britt, and Norman (34) compared ranking and non-ranking contestants in the first annual science talent search with 6730 army inductees under 20 years of age and found them significantly superior to the army sample in stature and weight. The 220 ranking contestants had significantly fewer physical defects than the 1786 non-ranking contestants with the exception of visual defects. Reynolds and Schoen (138) described the resemblances and differences revealed by a longitudinal study of monozygotic triplet boys from eight thru 18 years of age.

Krogman (76) published a handbook which explains how height and weight measurements should be made; and more important how they should be interpreted. This was an excellent presentation of the problem, methods to be used, and evaluative technics. Krogman (77) also discussed the value of the use of the skeleton in estimating morphological maturity. A grid for recording the weight of premature infants (30) was also available.

Adolescent Development

Ellis (37) found that the age range of onset of pubescence may show a variation of several years and that the duration of pubescence seems longest in those reaching this stage early or late. He found an acceleration in growth about six months before the onset of pubescence. Ellis (35) stressed the fact that height and weight curves may go out of date and that maturity level must be considered in evaluating such data. He also found that the earlier maturity of girls was substantiated.

Reynolds and Wines (139) made 557 semi-annual examinations of 49 girls and studied maturation, size, shape, and areolar protrusion of the breasts; development of pubic hair; menarche; and the interrelations of these maturational features. Five different types of maturational extremes were compared and it was promised that subsequent reports would deal

with axillary hair, osseous development, menstrual patterns, differential tissue growth, physiological function, growth of body segments, and endocrine activity during adolescence. Marchetti and Menaker (86) applied several criteria and concluded that the optimum time for having the first child, from a purely obstetrical point of view, was at 16 years of age or less.

Stuart (153) discussed pubescence, differentiating characteristics of early and late pubescence, and factors influencing, or associated with, variability in adolescent maturation which may have significance for health. Stuart also stressed the importance of food and feeding habits for time and degree of growth and for skeletal and sexual development. Several studies have stressed the importance of food and feeding for skeletal and sexual development. This work has been confirmed by the experiments with animals in which great postponement of sexual development followed the administration of diets deficient in caloric content.

Deamer (30) reported that increased rate of growth, at least in boys, may be obtained by the use of sublingual testosterone therapy in the prepuberty period, but that these children will still be small individuals at cessation of treatment. He warned that treatment must not be carried to the point of undue advancement of bone age. He also called attention to possible disadvantages inherent in this method of obtaining an increased rate of growth. Dwarfism in healthy children was also studied by Talbot and others (155) and was judged to be caused in some cases by emotional and nutritional inadequacies (anorexia secondary to emotional disturbances). In view of this the use of testosterone as initial treatment seems very unwise.

Bergman (18) published a differential diagnostic table of sex precocity and the adrenogenital syndrome with an account of 17 urinary ketosteroids which should be of value in the recognition and clinical management of these individuals.

Growth of Body Segments and Tissues

Growth of the human head from birth thru the third month of life was investigated by Ortiz and Brodie (122) in 135 infants. As an aid in the early recognition of hydrocephalus, retarded mental development, and appraisement of the normal infant, Silver and Deamer (146) published graphs of the head circumference of infants. Allen (4) studied the facial growth of children ranging in age from five to eight years. A greater amount of growth was found in the lower facial measurements than in the upper, and the growth was found to be greater in boys than in girls. Valuable information on facial development from 12 to 22 in males was furnished by a Swedish study (19).

Count (26) supplied some exceptionally valuable data on the growth of the brain from the fetal period to adulthood. Particular attention was paid to the question of how brain weight grows with respect to body

weight. French (39) studied brain tumors in children from birth to age 16 and concluded that they occur with equal frequency at all ages thruout childhood.

The diameter and cross-sectional area of the hair of children from birth to maturity was studied by Trotter and Duggins (160). Developmental changes were found to cease at a relatively early age. After the second year no uniformity in trend was found in the index used and after an initial rapid increase in cross-sectional area during the first three years the increase was slow and irregular. Monthly samples were used.

The growth of the human pituitary fossa was studied from the fifth fetal month thru the adult by Francis (38). The length was found to increase very rapidly during the last 24 weeks of the fetal period, but there were no sex differences. Both length and depth measurements showed a rapid growth during the first year of post-natal life and then length accelerated again at puberty. Rasmussen (131) plotted the weight of the 122 normal hypophyses of white children from birth to 19 years of age against stature, and noted concave curves. The weight of the gland plotted against age gave a growth curve which was practically a straight line. The same author (132) also reported on changes in the proportion of cell types in the anterior lobe of the hypophysis during the first 19 years of life and concluded there were no distinct histological cycles that could be correlated with physiological cycles.

Natal teeth occurred approximately once in 2000 births in a study of the phenomena in two Chicago hospitals (89). Median and mean ages as well as standard deviations for the eruption of the first six teeth were furnished by Hurme (63, 64). The statistical material comprised 93,000 children from the northern temperate zone. Stillman (145) plotted maxillary and mandibular curves against age for 38 children from birth to nine years and found that the curves for those with poor occlusion tended to converge or diverge.

Dreizen and others (32) found no apparent difference in the incidence of dental caries between poorly nourished and adequately nourished children or between those receiving a supplement of one quart of milk per day and those not receiving the milk supplement during the period of their study. The relationship of nutrition to dental caries was studied by many groups and individuals (112). Sognnaes (150) made a clinical analysis of certain well established trends in the dental caries incidence which occurred in children in Europe during the past 50 years. This analysis throws doubt upon the sufficiency of oral environmental factors in the causing of dental caries. A marked wartime reduction of dental caries in European children was found. This outcome could not be explained on the basis of an increase in the consumption of any previously demonstrated caries preventing food or food factor. One great difficulty in all caries research is that caries progress at variable rates of speed, and a variable period of latency seems to intervene before the effect of any imposed regimen may be felt.

Massler and Schour (90) found that the dental caries incidence in 162 children aged 10 to 18 years and living in Naples was less than one-half of that observed in children of similar ages in the United States. They concluded that, since these children were for the most part malnourished, the relation between good nutrition and a protective influence against dental caries was not borne out by their study.

Nutrition Reviews (114) published a good general review of the problem of fluorine in relation to dental caries and the *Quarterly Review of Pediatrics* for November, 1949 (128), contained a splendid special section on children's teeth, dental caries, and related problems. Among other topics this issue dealt with the pathology of dental caries, carbohydrates plus lactobacilli as destructive agents, fluoride and caries, nutrition and dental decay, miscellaneous conditions of teeth and gums, and ranges of normalcy in the eruption of teeth.

The use of the skeleton to estimate morphological maturity has been generally accepted. Greulich and Pyle's (51) new atlas will prove invaluable to workers in this field. Abbott and others (1) recommended that carpal and epiphyseal development be used as another index of nutritional condition. Data concerning the lengths of the femur and the tibia from five years until epiphyseal closure were published by Anderson and Green (5). They paid particular attention to the factor of variation in rates of skeletal maturation. The pattern of the development of ossification centers in 1112 single-born infants was presented in tabular form by Christie (23). Kelly and Reynolds (69) published tables giving the order of appearance of ossification centers, appearance of distal epiphyses of long bones, area of carpal bones, measurement of long bones, and other diameters for 305 white and 120 Negro infants assessed at about 28-day intervals during the first year of life. Milman and Bakwin (99) studied ossification of the metacarpal and metatarsal centers as a measure of maturation in children from one to five years of age. A thoro review of the structure of bone, growth of bone, chemical and enzymatic problems of ossification, chemical nature of bone, bone metabolism as studied by means of radioactive isotopes, influence of dietary factors on bone, and influence of hormonal factors on bone was published by Dallemande (28). Potter and Meredith (126) recommended that biparietal diameters be taken by direct measurement and bignonial diameter be taken from measurements of the posteroanterior roentgenogram in growth studies of the young child. Schmid (143) published data for the time of appearance and for the greatest length and breadth of wrist bones for children from three months to 18 years of age, assessed between the years of 1933 and 1947. Townsley (159) reported on the influence of mechanical factors on the development and structure of bone for fetuses of three, five, seven, and eight months and for infants and children of one, 12, 15, 30, 48, 96, and 120 months.

Reynolds and Grote (137) compared tissue distribution in the male leg with that of the female from birth to maturity. Males exceeded females in

mean breadth of muscle, bone, and total breadth of calf, while females were larger than males in mean breadth of tela subcutanea plus skin, and these differences were pronounced in adolescence and maturity.

Maresh (87) measured 3205 roentgenograms of 71 boys and 57 girls in good health taken during the past 20 years. These data were used to assess the significance of the size of heart by relating the measurements to the basic process of growth and maturation of the individual. Meyer (97) published an equation for the measurement of children's hearts together with a nomogram making it possible to read directly any percentage variation from the normal.

Interrelatedness of Some Growth Phenomena

Norval (110) found that infants who were relatively long for their weight began to walk at an earlier age than the others. She also found that the age at which babies started walking was not significantly related to weight at birth. Length at birth correlated negatively with walking age. Worcester and Lombard (173) were unable to predict leg length at age 16 accurately from leg length, height, and ratio at ages seven or 12.

Blood volumes in normal children varying in age from one to 17 years were found to be related to body weight by a linear equation, to stature by an exponential equation, and to surface area by nonlinear equation of the second degree (101).

Shepherd, Sholl, and Vizoso (144) found the size relationships between body length to be linear between infancy and maturity. Adolph (2) published a chart for mammals by means of which from the value of one characteristic of a mammal 33 others could be roughly predicted. Bayer and Bayley (13) published directions for measuring height and assessing skeletal age for use in predicting height. Gray (50) evaluated three methods of predicting adult stature and found the respective percentage errors to be 2.8 for mid-parent rule; 2.5 for Walford's transform; and 2.0 for Bayley's bone-age.

Muhsam (102) found that prepuberal growth and post-puberal growth in girls were negatively correlated. Correlation patterns for growth in height and weight were found similar, but the compensation for growth in height began one or two years later for that growth in height.

Washburn (167) reported that the use of an ischium-pubis index gave an accuracy of over 90 percent in predicting sex from skeletal remains provided they are from the same racial group. In children the index proved of little use, for the average difference between boys and girls remained at 2 to 3 percent throughout childhood.

Reynolds and Clark (136) found creatinine excretion closely associated with muscle breadth and with bone breadth and very slightly associated with fat breadth. Jones (67) found strength as measured by grip, pull, and thrust positively related to height, weight, chronological age, skeletal age, and popularity. Relationships between strength and measures of intelligence and popularity.

gence were found to be considerably lower. Relationships with socio-economic factors were found to be negligible. Personality problems stemming from physical status and interpretations and implications for educational programs and for high-school counselors were offered.

Body Build and Body Proportions

Hunt (62) questioned Sheldon's view of somatotype as a simple predominance or balance of one or more of the embryonic germ layers, contending that such an explanation was not entirely adequate. He reported that endomorphy, ectomorphy, and mesomorphy represented the retention or exaggeration of growth phases which reached a peak at the post-natal age of nine months, nine years, and in adolescence respectively. Each might also be produced by variations of growth gradients. The three temperament classifications were also related to various post-natal growth periods. Lasker (78) presented evidence to show that partial starvation may alter somatotype. Reynolds and Asakawa (135) studied a series of 167 children for degree of obesity and established five types: obese, mixed obese, relatively obese, relatively mixed obese, and not obese. They suggested that failure to differentiate types of obesity, and the inclusion of subjects who are not obese may account for conflicting results in studies in human obesity.

Growth of Some Bodily Functions

Norval, Kennedy, and Berkson (111) found that the blood sugar of 51 normal infants showed an average increase of 2.8 mg. per 100 cc. per day during the first six days of life and that there was no evidence of stabilization of blood sugar during this period. The need for accurate figures on energy expenditures of children in connection with nutrition studies prompted Taylor, Pye, and Caldwell (157) to study the energy expenditures of seven boys and 12 girls ranging in age from nine to 11 years while they were standing, drawing, and dressing and undressing in a respiration chamber. Gesell (46) reported on the developmental aspects of vision.

Several studies of the electrocardiograms of young children and infants (88, 154, 161) showed that special characteristics peculiar to youth were present and that these phenomena were most evident in the youngest children. The subjects used were normal children, so the deviations found could not be considered indicative of future pathology especially in view of the fact that they varied directly with age, diminishing as the children grew older. These highly interesting developmental facts should prove of great value in assessing heart conditions in children.

It is apparent that electroencephalography has been widely used during this period in studies of child development (57, 66) for the following purposes: (a) for the establishment of normal patterns for various age groups (58, 61, 66); (b) for the localization of focal cortical abnor-

malities (25, 60, 119); (c) for the study of cerebral electrical dysrhythmias associated with epilepsy (80); (d) for the study of special serious behavior problems (98); and (e) for the determination of the effects on brain waves of various stimuli and psychologic states (59). In the future, encephalography may well bear additional important fruit when it is applied to the study of learning and problem-solving types of behavior.

Appraisal of Physical Status and Growth

Meredith (95) developed an anthropometric program for schools wherein it is not considered practicable to do more than measure height and weight. (Ordinarily the minimum routine of anthropometry involves body weight, standing height, hip width, chest circumference, leg girth, and subjective ratings of the thickness of two selected folds of skin and subcutaneous tissue.) He also (96) provided school health workers with measurement and rating equivalents for thickness of skin and subcutaneous tissue in two regions; above the ilium and below the scapula, as well as tables of equivalents for normal use covering the age period from four to 18 years for each sex. Cowden (27) published some simplified methods of fitting certain types of growth curves.

The Wetzel Grid records height-weight-age data in graphic form and attempts to evaluate the child with reference to his own age-peers and to his own unique biogenetic endowment. Krogman (76) recommended the use of the Wetzel Grid Technic in connection with height-weight measurements. The newly developed Red Graph offers a method whereby the symmetry of skeletal status and progress during growth may be quantified and interpreted roentgenograms graphically. Several experimenters (85, 127) urged its use as a method of determining the symmetry of status and progress during growth. Children who are often grouped into a single category by the Wetzel Grid technic may be separated by the X-ray findings used in making the Red Graph. Only in this manner can children who are small because of their genetic inheritance be separated from those who are small because of inadequate nutrition (103). The Red Graph makes use of the most advanced bone as an indicator of the child's potential optimum development, provided this advanced bone is not by chance greatly exceeding a desirable speed of growth for that child. Great width of the Red Graph at any point indicates a lack of developmental symmetry, the causes of which should be investigated. Just how such judgments can be made was not made clear. Moreover, the evidence justifying the assumption that all the bones in the body should develop at the same rate was not presented.

The Todd Graph and the Red Graph differ in that the Todd Graph plots an average of the maturities of the functional parts of the body as revealed by the roentgenogram while the Red Graph plots both the most advanced, lagging, and average parts. Greulich (51), continuing Todd's work, accepted the Red Graph as a useful device.

Physical and Physiological Influences on Mental Growth

Some of the original promise involved in the use of glutamic acid to improve mentality has not been fulfilled. Zimmerman and his group (129, 175, 176) continued to report success with its administration, but the value of glutamic acid as a therapeutic agent in mental retardation has not been universally accepted (9, 116, 164). Some well planned and controlled experiments have given negative results. Loeb and Tuddenham (82) carefully selected their subjects, and, using the method of covariance, found no significant differences between their control and experimental subjects. They used several measures of mental status, the Stanford-Binet (Form L before and M after), the Cornel-Coxe Performance Ability Scale, the Porteus Maze, the Thurstone and Thurstone Primary Mental Abilities, and the Rorschach. They expressed the conviction that the differences between their results and those of Zimmerman may be accounted for by differences in degree of control, in design of the investigation, and in the nature of the statistical analysis of the outcomes. Kerr and Szurek (72), and McCulloch (84) also failed to confirm the beneficial effects of glutamic acid. To date, the preponderance of evidence seems to indicate that if the experiments were expertly designed and controlled, and the results carefully evaluated, the verdict is "not proven."

Another pioneer approach to the problem of mental deficiency was that of Beck, McKhann, and Belnap (16), who developed a surgical procedure to produce redistribution and increase of blood flow to the brain. At the time of writing their paper 11 patients had been operated upon, but the paper reported the results for only four of these. These experimenters were enthusiastic about the outcomes, but evaluation must certainly await further data.

Denhoff, Holden, and Silver (31) administered Tolserol to 16 children ranging in age from three to eight years with cerebral palsy. Five methods of evaluation were used, neurologic, orthopedic, psychomotor, behavior, and laboratory (toxemia). No consistent, outstanding, over-all improvement was found.

The effect of added thiamine on growth, vision, and learning was investigated by using 36 pairs of identical twins over an original period of four and one-half months with an added four and one-half months period for 25 of the pairs of twins (140). No statistically significant gains were found in any of the measures used; these measures were weight, height, manual dexterity, prolonged memory tests, vision, intelligence, reasoning, arithmetic, rote memory, and code substitution.

These studies of physical and physiological influences on mental growth and function seem to have produced no brilliantly positive results. This does not mean that these experiments are worthless, for, on the contrary, a very great merit inheres in their opening of new areas for exploration, and in their stimulation of further research in the field of

nerve and brain metabolism. Approaches such as these should be greatly encouraged. Intrinsically they are far superior to the inertia engendered by acceptance of the fatalistic doctrine that genetic considerations irrevocably predetermine matters once and for all.

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¹ Corrected to January 1, 1951. Report errors immediately to the secretary-treasurer.

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Index to Volume XX

Page citations are made to single pages; these are often the beginning of a chapter, section, or running discussion dealing with the topic.

- Accounting, 135; financial, 137; supplies and equipment, 138; systems of, 137
Achievement, prediction of, 21, 82, 353
Achievement tests, 7, 63, 87
Action research, 207
Adjustment, 277, 304; of adults, 178; social, 374; in social groups, 192
Administration, of adult education, 224
Adolescence, mental development during, 350; physical growth during, 394
Adult education, 165, 334; agencies of, 201, 230; in the armed forces, 165, 203, 235; audio-visual aids, 216; characteristics of adults, 171; for citizenship, 236; in colleges, 227, 231; content, 198; defined, 168; by extension, 202; by government agencies, 203, 235; group dynamics, 185, 208; for illiterates, 203, 218; learning methods, 177, 207; legislation for, 225; objectives of, 198; organization and administration, 224; philosophy of, 165; in prisons, 202; in public schools, 201, 227, 231; relation of content and method, 200; and social class, 193; trends in, 165; vocational education, 201, 233
Adults, adjustment of, 178; group activities of, 185; intelligence of, 174, 360; learning ability of, 177; motor development of, 368; physiological changes in, 171; psychology of, 171
Agricultural education, 330; for adults, 233, 334; audio-visual aids, 335; curriculum, 332; inservice training, 335; teacher training, 333; teaching load, 332; for veterans, 331
Apportionment, of school revenues, 109
Aptitude tests, 6, 27, 353; art, 34; clerical, 32; differential, 27; mechanical, 31; music, 34; professional, 32; subject-matter, 30; visual, 34
Arithmetic tests, 66
Armed forces, adult education in, 165, 203, 235; audio-visual aids in, 217; tests in, 8, 28
Art, and personality, 56
Art aptitude tests, 34
Attitudes, 266, 279, 304; measurement of, 46; racial, 376
Audio-visual aids, 265, 335; in adult education, 201, 216; in the armed forces, 217; needed research in, 219
Auditing, 135, 138
Auditory acuity, of adults, 173
Auditory defects, 345
Award contests, 76
Bonds, 143
Budgeting, 135; state control, 136
Building costs, 125
Building needs, 125
Bus drivers, 146
Business administration, 115, 142
Business education, 322; accounting, 324; for adults, 233; bookkeeping, 324; clerical occupations, 326; distributive occupations, 326; general business training, 325; shorthand, 322; trends in, 322; typewriting, 323
Capital outlays, 110, 142
Camping education, 287
Child development, 344
Citizenship education, 166, 185, 236, 257, 266
Clerical aptitude tests, 32
Commercial education, 259
Community research, 193, 239
Community resources, 259
Community surveys, 194
Conservation education, 259
Consumer education, 259
Contemporary affairs, 260
Costs of education, analysis, 124; buildings, 125; estimating, 109; higher education, 128; inequalities, 124; per pupil, 124, 127; predictions, 129; and quality, 126; trends, 124; units, 127
Counseling, of adults, 208
Critical thinking, teaching of, 262
Culture, and intelligence, 346; and personality, 377
Current events, 260
Curriculum, for adult education, 198; social studies, 257
Custodians, 149; inservice training, 149
Debt administration, 142
Delinquency, 375
Democracy, education for, 263
Dental services, 149
Dexterity tests, 31
Discussion groups, 185, 186, 210
District reorganization, 115; criteria, 116; and economy, 120; methods of achievement, 117; needed research, 120; obstacles, 118
Driver education, 311

- Economics, 258
 Emotions, and group activities, 191
 Environment, and intelligence, 346
 Extension education, 165, 202
 Extracurriculum activities, 295
- Factor analysis, 17, 40, 94, 351, 370
 Family-life education, 299; curriculum, 300; methods, 300; needed research, 306; teacher training, 305
 Family relationships, 375
 Federal aid, 107
 Federal support of education, 224, 235
 Field trips, 219
 Film forums, 216
 Finance, school, 105, 142; planning, 108; and reorganization, 115; state foundation programs, 108
- Geography, 259
 Geography tests, 66
 Group discussion technics, 264
 Group dynamics, 185, 188, 208, 265; needed research in, 192
 Growth and development, 344, 389
- Handedness, 366
 Handicapped, personality of, 379
 Health, of school children, 392
 Health education, 238
 Health programs, 150
 Higher education, cost, 128; financing of, 107
 Home-economics, 300; tests, 302
 Human relations, 274
- Industrial arts education, 309; aptitude tests, 313; curriculum, 310; history of, 311; methods, 310; shop planning, 312; teacher education, 309
 Industrial education, 309, 317; for adults, 233
 Inservice training, 335.
 Institutional training, 287
 Insurance, school, 148; transportation, 148
 Intelligence, and achievement, 20, 353; of adults, 174; changes in, 22; changes during maturity, 360; decline of, 361; effect of chemicals on, 355; growth of, 19, 175, 344, 354; physiological influences on, 401; sex differences in, 354; and socio-economic status, 354
 Intelligence tests, 6, 17, 344, 350, 360; applications of, 20; new developments in, 17
 Intercultural education, 274; development of, 274; methods, 277; needed research in, 281; research methods, 281
- Intercultural relations, 236
 Interest inventories, 44
 Interests, measurements of, 44; reading, 295; recreational, 296
 International understanding, education for, 237
 Item analysis, 91
 Labor unions, educational programs of, 234
 Language tests, 70
 Leadership, 267, 381; in discussion groups, 186, 210
 Learning, social factors in, 186
 Leisure, education for, 294; in college, 296; in elementary school, 294; needed research, 297; in secondary school, 294
 Libraries, as agencies for adult education, 232
 Literacy, 203, 218
 Local surveys, 119
- Mathematics tests, 67
 Measurement, of growth, 400; of intelligence, 344; of motor ability, 369; of personality, 382; (see also Tests)
 Mechanical aptitude tests, 31
 Medical services, 150
 Memory, of adults, 178
 Mental ability, growth of, 19
 Mental development, 344
 Mentally retarded, 354
 Mental traits, 350
 Methods, in adult education, 207
 Morale, of teachers, 306
 Motor development, 366; in adults, 368; during childhood, 366; measurement of, 369; sex differences, 370
 Museum materials, 219, 232
 Music aptitude tests, 34
- Nonteaching personnel, 149
 Objectives, of adult education, 198
 Organization, of adult education, 224
- Personality, 374; age differences in, 179; and art, 56; changes with age, 378; and culture, 377; effects of infant experiences on, 374; and family relationships, 375; of handicapped, 379; inventories, 38; measurement of, 382; and physical characteristics, 382; and social class, 378; tests, 38, 51
 Personnel, nonteaching, 149
 Personnel selection, 82
 Philosophy of education, for adults, 165
 Physical fitness, tests of, 369

- Physical growth and development, 389
 Physical handicaps, 345
 Prediction of achievement, 21, 82, 353
 Prejudice, 274, 376
 Prenatal development, 389
 Primary mental abilities, 350
 Projective techniques, 51, 382
 Property taxes, 105
 Psychodrama, 208
 Psychology, of adulthood, 171
 Public relations, 312
 Pupil-teacher planning, 264, 301
 Purchasing supplies, 147
 Race attitudes, 376
 Race differences, 392
 Radio education, 218, 238
 Readability, 70, 201; of interest inventories, 45
 Reading, in social studies, 264; tests, 65, 67, 70
 Recreational personnel, 296
 Reliability, of personality inventories, 41
 Religious education, 237
 Reorganization, of school districts, 115
 Report cards, 7
 Reporting, financial, 135, 139
 Role-playing, 208
 Salaries, of teachers, 125; of custodians, 149
 Scholarship contests, 76
 Science tests, 70
 Sex differences, in intelligence, 354; in motor ability, 370
 Social adjustment, 374, 380
 Social class, 275; and adult education, 193; and personality, 378
 Social development, 374
 Social education, 257
 Social factors in learning, 186
 Social studies, 257; audio-visual aids, 265; citizenship education, 266; community resources in, 259; conservation education, 259; consumer education, 259; contemporary affairs, 260; course offerings, 258; curricular organization, 261; curriculum, 257; economics, 258; geography, 259; history of, 257; neglected areas, 260; teaching critical thinking, 262; teaching democracy, 263; tests, 266; textbooks, 261
 Social welfare, 238
 Socio-economic status, and intelligence, 354
 Sociometry, 265, 305, 380
 Speech development, 345, 346
 State aid, for adult education, 226
 State support of education, 106, 146
 Supplies, accounting, 138; purchasing, 147
 Support of education, 105; economic, 105; federal, 107; local, 105, 111; measures of ability, 111; by states, 106
 Surveys, community, 194; local, 119
 Taxes, for support of schools, 105
 Teacher morale, 306
 Teacher-pupil planning, 264, 301
 Teaching load, 332
 Technical education, 315
 Television, 238
 Testing agencies, 9
 Testing programs, 65
 Tests, achievement, 7, 63, 87; administration of, 22; aptitude, 6, 27, 353; arithmetic, 8, 66; in the armed forces, 28; attitude, 46; in college, 68; dexterity, 31; education, 5; geography, 66; history of, 5; home economics, 302; in industry, 81; intelligence, 6, 17, 344, 350, 360; of interests, 44; item analysis, 91; item types, 90; language, 70; mathematics, 67; mechanical aptitude, 31; of motor ability, 369; personality, 7, 38, 51, 382; of physical fitness, 369; psychological, 5; publication of, 9; reading, 65, 67, 70; research on, 9; reviews of, 6; science, 70; social studies, 266; trends in, 11; use of, 10
 Textbooks, social studies, 261
 Transportation, costs, 145; insurance, 148; legal status, 146; state provisions, 146
 Unesco, 203
 Validity, of achievement tests, 92; of personality inventories, 41
 Visual acuity, of adults, 173
 Visual aptitude tests, 34
 Vocational education, 287, 309, 314; for adults, 201, 233; apprentice training, 315; curriculum, 316; in college, 288; in school camps, 287; materials, 314; technical education, 315
 Work education, 287
 Work-experience programs, 287; in college, 288; in corrective institutions, 287; needed research, 291; organization of, 288; outcomes, 289; present status, 290; in school camps, 287